FLASH—A SPECIAL ISSUE

POPULAR PHOTOGRAPHY

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

JANUARY, 1956 • 35 CENTS

How to use
- simple flash
- multiple flash
- bounce flash
- slave units

How good is flash with the NEW COLOR FILMS?

The facts about SPEEDLIGHT —a special section

How to test your flash equipment

8 flash errors— how to avoid them

Marina Vlady

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Even if he already has a *couple* of cameras – think about getting him one of these. It's the most exciting Christmas gift you can give him. You can put it under the tree with his name on it for as little as $1.19 a week. Drop into any camera dealer's for a demonstration. Ask to see the sample Polaroid Land pictures he has. And if you've got a spare minute, let him take your picture. You'll be sold. Left to right: Polaroid Highlander, $69.95; Pathfinder, $249.50; and Speedliner, $89.75.

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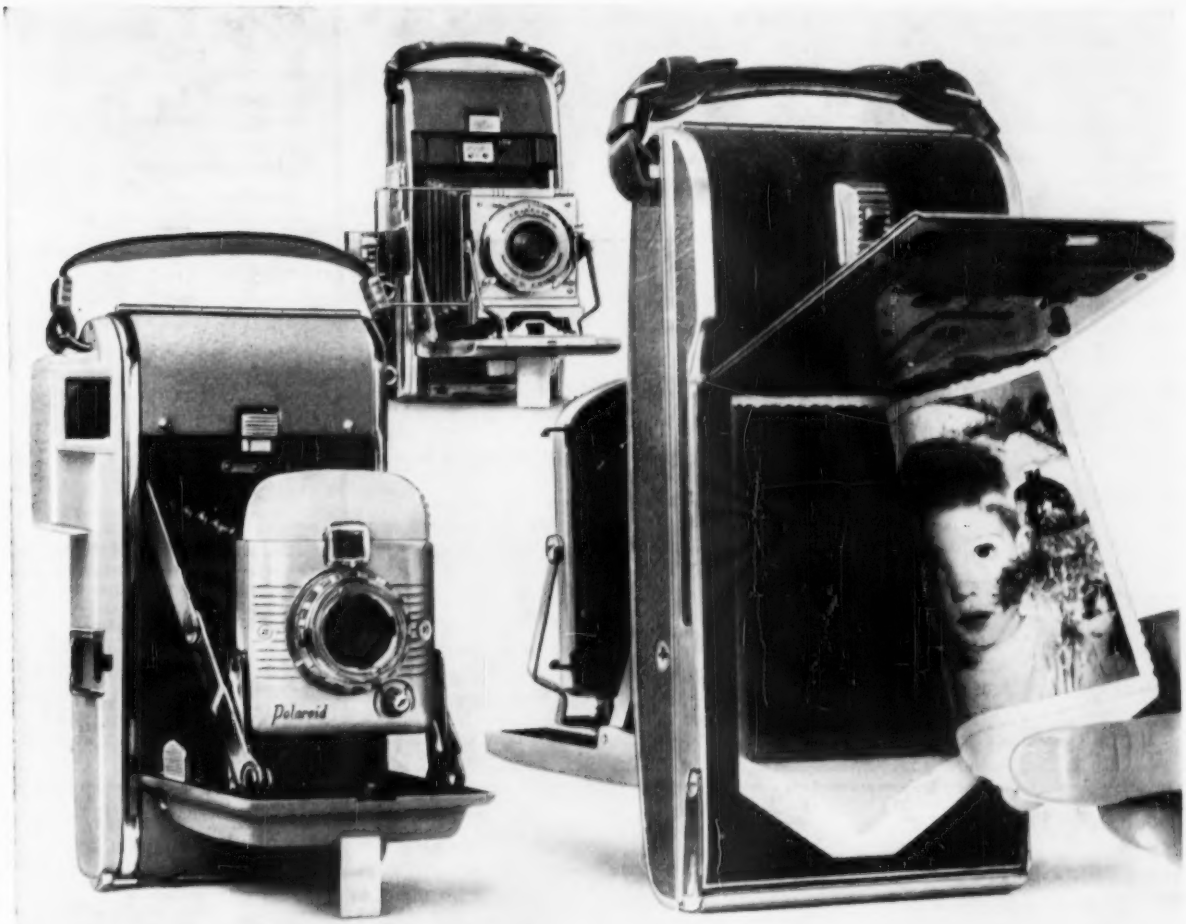

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JANUARY 1956

VOLUME 38 NUMBER 1

POPULAR PHOTOGRAPHY

including CAMERA and AMERICAN PHOTOGRAPHY

WORLD'S LEADING PHOTOGRAPHIC MAGAZINE

With his usual sensitivity, Philippe Halsman has penetrated French actress Marina Vlady's characteristic glamour to produce this intimate portrait. His effectual use of three speedlights has given texture and sheen to her hair. He shot with a 4x5 Fairchild-Halsman camera and 210-mm Bausch & Lomb f/4.5 lens. Exposure on Daylight Type Ektachrome was 1/100 sec at f/22.

POPULAR PHOTOGRAPHY SPECIAL FLASH ISSUE

42 Flashbulbs or Speedlights
44 What You Should Know About Flash Equipment *by Harvey Shaman*
50 Boost Your Available Light with Bounce Flash *by Bob Schwalberg*
52 What You Can Do with a Simple Flash Camera *by Carl Lindquist*
58 Bounce Flash Is Good for Color Too *by George Wisler*
60 Flash and the New Color Films *by Morris Gordon*
62 Halsman's Portable Speedlight Studio *by Norman C. Lipton*
66 Multiple Flash—Wires and Slaves *by Rus Arnold*
70 Don't Make These Common Flash Errors
72 Pictures with Flash
79 All About Electronic Flash *by Bob Schwalberg*
98 Which Flashbulb?
100 Portable Speedlights Today
126 Pep Up Your Bounce Flash

MOVIES

130 Films for Profit *by Ernst Wildi*
132 Fundamentals of Production *by Yael Woll*
134 New Kodak Brownie Has 3-Lens Turret

EQUIPMENT AND MATERIALS

106 Action-Vue—Unique Slide Viewer *by Otto Bayer*
113 Confused About Films? *by Arthur Barney*

MONEY-MAKING IDEAS

94 Custom Enlarging *by Lloyd West*

DEPARTMENTS

6 Letters to the Editor
10 Tools and Techniques *by Norman C. Lipton*
20 Color Clinic *by David B. Eisendrath, Jr.*
22 Legal Problems in Photography *by George Chernoff and Hershel B. Sarbin*
26 Camera Clubs *by Whit Hillyer*
28 35-mm Today *by Bob Schwalberg*
32 What's New—Trade Notes and News
40 Candid Shots
116 New Books
118 Photo Tips
142 Contests and Markets
158 Calendar of Exhibitions

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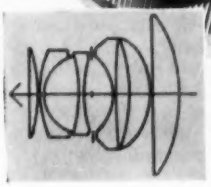

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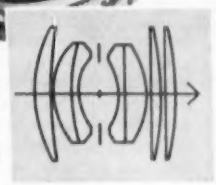

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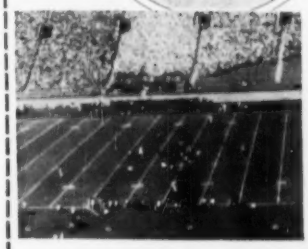
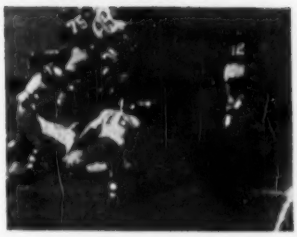


TYPICAL SHOT



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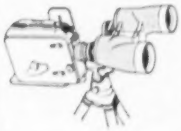

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letters to the editor

Photography at the Olympics

Your letter from Walter Schutz-Reuter in the October *Letters* column, showing a photo of the clause printed on each Olympic Games ticket prohibiting the taking of pictures at the Games, is so typical of British officialdom, it's priceless!

But people are getting fed up with such things . . . If the Olympics are supposed to be an amateur proposition financed by popular subscription, who, then, has a right to forbid photography?

BOB FORMAN
Monmouth, Ill.

• *According to local Olympic officials, photography from the stands is forbidden because the revenue which the Committee derives from contracting an "exclusive" arrangement with the press services plays an important part in making the Games financially possible. Past Committees have had to do the same thing in order to pay all the bills—since public subscription wasn't enough. There is no prohibition against photography outside the stands, where many fine pictures may be found. Besides—who knows if the regulation will actually be enforced.*—ED.

Seneres: Photography's Pepys

I don't think I've seen any remarks in your column regarding those sketches by Seneres at the end of some of your articles. He must be an amateur photographer at heart because the drawings hit the nail on the head every time. Personally I look forward to them in each issue.

NAT GOLDSTEIN
New York, N. Y.

Pleasant-Picture Dept.

I have always enjoyed reading your magazine and have wished that sometime I might have the honor of being represented in its pages. Because I haven't been out of high school long, I used a young model I knew, and have sent along this picture of her in the hopes you might use it. I used a Speed Graphic with Super-XX film, and an exposure of 1/50 second at f/9.

DAVID MUENCH
Santa Barbara, Calif.

Santa Barbara beauty

High School Photo Contest Bonus

This advertising agency and our client, Haber & Fink, are very much impressed with your new High School Contest.

Haber & Fink will be running local advertisements featuring the High School Contest. Also, an additional bonus of $100.00 in merchandise will be awarded to the winner if the entry blank was obtained from Haber & Fink.

Thanks to you and POPULAR PHOTOGRAPHY for your interest in encouraging photography among young people.

ARTHUR J. SHAW
Shaw-Shon Advertising
New York, N. Y.

Norbert, Not Norton

Please refer to the excellent portfolio of Eisenstaedt masterpieces, page 87, October 1955. When I was a student of mathematics in Professor (then Instructor) Wiener's class at MIT his name was Norbert, not Norton. It's a long time since 1922 so he may have changed it.

Such a minor error does not detract from general excellence of the magazine.

FRED H. TRAVERS
Philadelphia, Pa.

• *You are correct, of course. Our apologies to Professor Wiener.*—ED.

Steady Camera at Slow Shutter Speed

In your July issue Mr. Carl Lindquist offers some valuable tips on how to hold the camera steady in order to avoid blurred images at slow shutter speed. I would like to offer your readers an idea which occurred to me a few years ago and which I have put into practice hundreds of times with magnificent results.

If the camera is equipped with delayed-action shutter, set the diaphragm and shutter speed, set the delayed-action lever, press the shutter button or cable release, and then hold the camera steady, using your favorite bracing. You have from 10 to 15 seconds to brace yourself, hold your breath, etc. In this manner there is no reaction to your pressing the shutter button and you can concentrate on holding the camera steady.

In this way I have been able to give ½-second exposures without any noticeable blur on 8-diameter enlargements. If the camera has no delayed-action shutter, but is equipped with cable release, have somebody else press the release button for you while you hold the camera steady.

VALENTIN DE MOLLINEDO
Madrid, Spain

This picture is one of many in the BESELER COLLECTION. Larger copies of this photograph are available without advertising text. Write to Beseler giving name and issue of this magazine (Many unpublished pictures are eligible for the BESELER COLLECTION. Ask for details)

Great pictures are made

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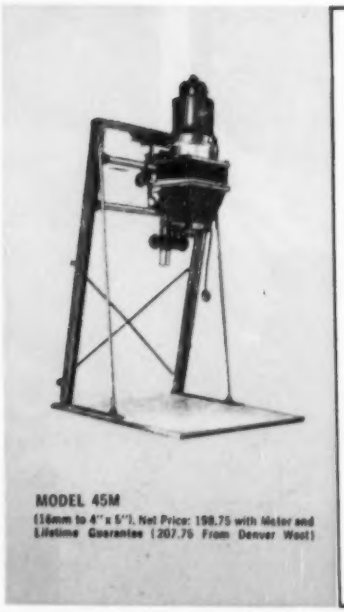

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We cannot tell from looking at a picture which enlarger was used. But if it's a fine picture we might know who the *photographer* was. This is proof that the *artist* makes the picture—that fine equipment can only help. *Creative picture making places the greatest demand on the Enlarger.* The Beseler Enlarger was designed and manufactured because no other enlarger gave us freedom from mechanical difficulties. With the Beseler we are free to concentrate on the picture. We know the Beseler helps us do *exactly* as our creative desire demands. If we want to project to a giant blow-up, we want accuracy. We want the lens axis to be at a 90° angle to the paper. We don't mean 88°, or 89°, or 90¼°, or "almost 90°", or "practically 90°." *We mean exactly and only 90°.* The Beseler Enlarger gives us horizontal projection at precisely 90°!

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tools and techniques

by Norman C. Lipton

A round-up of recent developments and significant trends

"Cronar" Base in Production. Late last September, after two years of construction, Du Pont's Parlin, N.J., plant for full-scale production of "Cronar" polyester photographic film base went into operation. On October 7, Du Pont announced that it had issued a non-exclusive non-transferable license to the Eastman Kodak Company to manufacture polyester photographic base and film under Du Pont patents. Apparently, a swing-over to the use of this relatively durable, thin, and dimensionally stable base material is in the immediate offing with cellulose tri-acetate receding gradually into limbo. Following several weeks of run-in operation, Du Pont had planned to begin coating their graphic-arts photographic emulsions on Cronar base, with motion-picture products and other protographic film materials following in order as production capacity permits. It was estimated that the first of these new products would not reach dealer outlets until the end of 1955. The Du Pont Photo Products Department indicated that no price change was contemplated for products converted to Cronar film base. As far as performance characteristics and technical data about the new polyester material are concerned, technical papers given by John M. Centa at the PA of A industrial meeting in Chicago last August and by Deane R. White at the October 1955 convention of the SMPTE may be had from the Photo Products Information section of the Public Relations Department of Du Pont at Wilmington 98, Del.

Polaroid Transparency Film. Spectacular demonstrations of Polaroid's new 1,000 ASA-meter-rated transparency film by photographer Ansel Adams and president Edwin H. Land of the Polaroid Corporation (the latter aided and abetted by Prof. Harold E. Edgerton of Speedlight fame) highlighted the recent Boston convention of the Photographic Society of America. In a program billed as *The Challenge and Opportunity of the Land Process*, on Friday, October 7, Mr. Adams screened a set of original black-and-white transparencies that he had recently made on the new material along with a number of copies of Stieglitz prints reproduced on the same one-step, picture-in-a-minute film. Various degrees of warmth and coldness were imparted to the screen image by hooking up the projector lamp with a variable rheostat which was adjusted for predetermined voltage settings for each slide. During the evening of the same day, Dr. Land gave a paper which sketched the background of the new transparency material and its place in Polaroid's over-all program and also went into the details of its unusual characteristics. This was supplemented by a demonstration in which pictures were exposed before the eyes of the audience on the new material and projected within two to three minutes—pictures of people, the audience itself, as well as bow-and-arrow and ballistic studies shot by speedlight under the watchful eye and with the enthusiastic cooperation of Dr. Edgerton—no mean Nimrod he.

The new transparency film is handled in exactly the same manner as Polaroid's various one-step print materials. Instead of a print, a positive black-and-white transparency is peeled out of the open rear door of the camera. The negative is discarded and can not be reclaimed or used a second time. The 1,000 speed rating of the sensitized material is by far the fastest nominal exposure index announced to date, but unlike negative films, it can't be forced any higher by changes in the normal developing time or by choice of developer. The gradation range is extremely long and the blacks appreciably blacker and the whites far whiter than those reproduced by good paper prints. When the new material becomes available to the public in the near future, it will come in sizes to fit all available Polaroid camera models. Slide masks and a simplified projector will complete the transparency system, according to the manufacturers.

Todd-AO. Three years and some months since our first look at preproduction Cinerama and after innumerable experiences with wide-screen movie projection processes of varying aspect ratio and circumference (including Circarama—the picture's all around you) we managed to squeeze in to see the fourth matinee press preview of *Oklahoma*, the only current example of the new Todd-AO wide-screen movie system. The sponsors of this system had originally proclaimed it to be the last word in audience participation—essentially, a Cinerama-type presentation without the jiggle between the edges of the three adjoining screen sections. We can report today that Todd-AO has almost made the grade, but not quite. There are bits and scenes interspersed throughout the production which vibrate with three-dimensionality and feeling—scenes in which all of the elements that contribute to solid spatial relationships are used: side- and backlighting; tack-sharp focus from close-up to the middle distance; large foreground subjects offsetting smaller images farther away from the camera; precisely exposed, full-bodied colors; and action that conveys the feeling of depth and participation. And there is no sectional jiggle, for the broad 2:1 image is completely contained on a 65-mm width of 70-mm release print film (the remainder is used for the 6 sound tracks). But there are far too many visually boring scenes between these all-too-infrequent highlights where any possible feeling of depth is ruined by over-exposure to the point where the colors wash out; by flat lighting; by vignetting

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Canon

of the corners of the deeply curved concave screen; by inverted spatial relationship of objects in the scene, and by an unhappy use of selective focus. The release print itself is marred by scratches. The mammoth size of the close-up figures is breath-taking in some cases, ridiculously elephantine in others. And the dipping horizon lines and curved horizontals at the edges of the screen from where we sat bespeak a wide-angle nightmare. The production itself should succeed despite its failure to fulfill completely its technical promise, for *Oklahoma* is a winner if only for the Rodgers and Hammerstein music and the expansion of the stage play into the great outdoors. Conceivably a second production in Todd-AO sidestepping the flaws of this first production and produced with careful attention to the elements that contribute to the audience participation feeling originally envisioned could prove the process an ultimate answer to the spectacular movie road-show problem.

Voigtlander Interview. At a recent press conference arranged by Willoughbys, New York, exclusive U.S.A. distributor for Voigtlander, director Adolf Oehme of the well-known German manufacturing concern disclosed a number of interesting facts about photography in Germany and his company's attitudes and activities.

(1) By the end of 1955, some 3 million cameras will have been manufactured in Germany of which about 250,000 represent the medium-priced cameras in the Voigtlander line.

(2) Sixty percent of German camera manufacture is earmarked for export, and much of the remaining 40 percent finds its way into the hands of tourists in Germany; 10 percent of the German export quota goes to the U.S.A. market.

(3) On the occasion of Voigtlander's 200th anniversary in 1956, one or possibly two new 35-mm cameras will be introduced by the company by way of commemoration . . . Voigtlander is not concerned about competition from Japan; as the industry and market continue to grow, all should get their fair share of business on the basis of the quality of the merchandise offered.

(4) Gauthier will soon introduce Prontor shutters incorporating the LVS (light value scale) exposure system with cross-coupled lens aperture and shutter speed scales, thereby matching F. Deckel's Synchro-Compur line, in which LVS first appeared in the spring of 1954.

(5) Almost 90 percent of the cameras made in Germany today are 35-mm, largely as a result of the ever-increasing interest and activity in color-slide making.

(6) Only a small part of the German camera public buys high-speed film; the slower thin emulsion materials are very popular today. In keeping with this trend, Voigtlander manufactures f/3.5, f/2, and f/1.5 equipment to the exclusion of slower lenses . . . Polaroid 1-step photography could not be sold to the German public after two years of sustained effort—probably because of the large film format and the inability of the worker to create pictures in the darkroom from a negative. . . . Amateur cinematography is relative-

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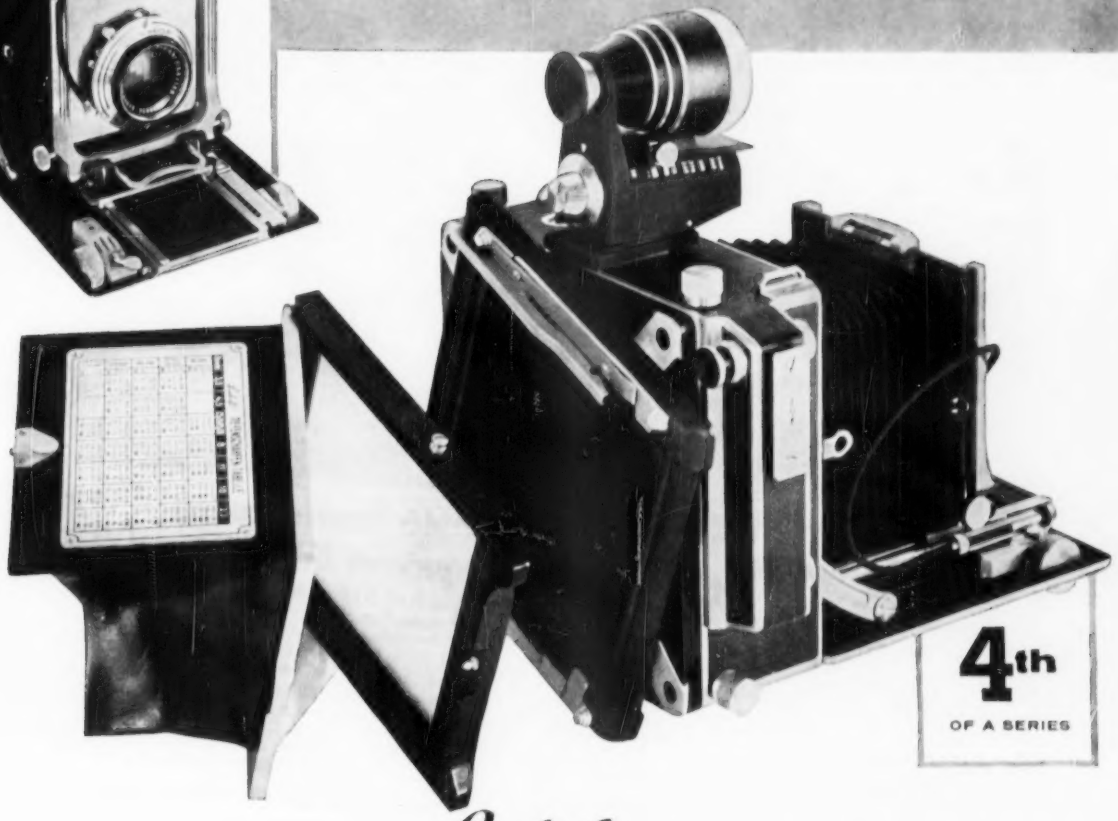

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THE *Linhof* REVOLVING BACK

The Linhof Super Technika is the only large-negative hand camera with a revolving back. And that is entirely understandable when you consider that the Super Technika is the only large-negative hand camera with front and back swings and tilts, triple-extension bellows and other exclusive features.

The revolving back is another important contribution to the ease of picture-taking. It is hard to understand how any large-negative camera can omit it and still lay claim to versatility. Anyone who has ever handled a camera — particularly a large one — can appreciate the advantage. Instead of twisting the camera, first one way for horizontal pictures and then, another for verticals — the revolving back permits you to hold the camera in one accustomed position and to select either vertical or horizontal format by simply rotating the back. And if this doesn't seem to make any difference, imagine shooting on a tripod. Rotate the back and you have either format, whereas with other cameras you must remove the camera and attach it again in another position. This can become quite awkward.

Among the added advantages of the Linhof back is the fact that it is easily removable. This permits a choice of several types of backs which can be easily and quickly interchanged. The Universal 4 x 5 Back accommodates 4 x 5 Linhof Film Holders as well as standard American press-type film holders. It also accepts film pack adapters, roll film holders, film magazines, Polaroid camera back and enlarger attachments. The Universal 3¼ x 4¼ back is similar to the 4 x 5 back except that it permits 3¼ x 4¼ film and other material to be used with a 4 x 5 Super Technika.

The Revolving Back is only one of the reasons why the Super Technika is called the ***'world's most versatile camera'***. There are many other added advantages which you cannot find in any other camera in the large negative field—and which you can enjoy for very little more than the cost of conventional equipment. Super Technika cameras are available in 2¼ x 3¼ and 5 x 7 models as well as 4 x 5.

Copies of this and previous ads on other Super Technika features may be obtained by writing to the address below. Descriptive literature and price information will be included.

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***Linhof* Corporation of America**

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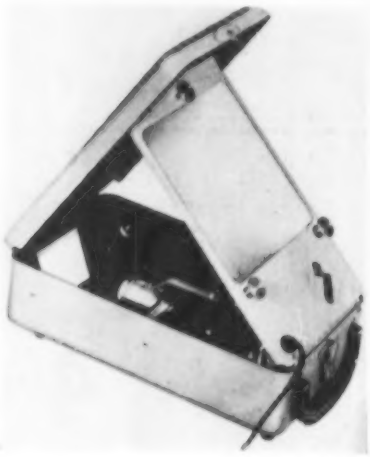
ly unpopular in Germany, which is contrary to the situation in France and Switzerland . . . In Germany, Kodachrome costs about 30 percent more than similar color-transparency films, yet it is by far the most popular of all color materials.

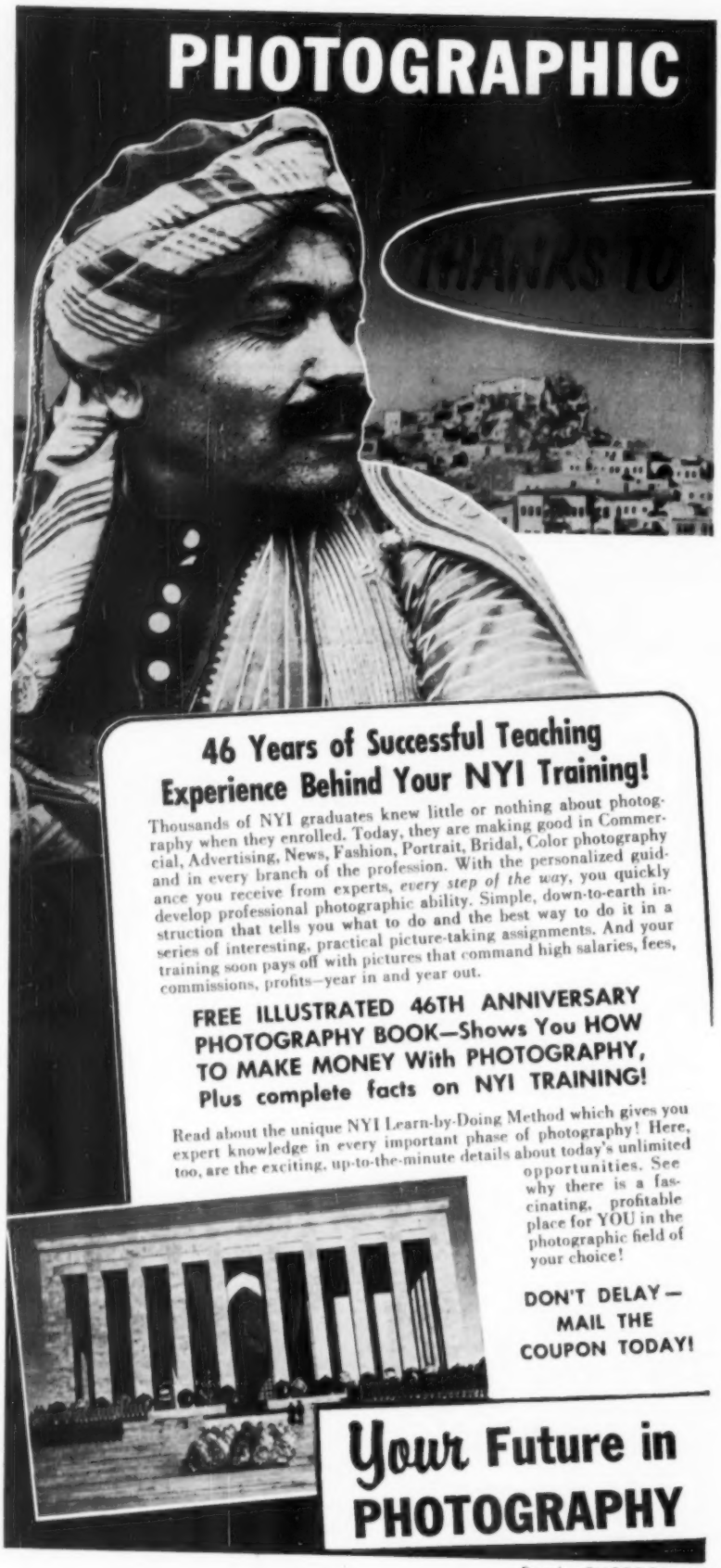
Self-Contained Slide Viewer. The lure of the 35-mm color-slide business has become so appealing that the Camera Optics Company of New York, which had formerly devoted all of its efforts to manufacturing flash equipment, is now the proud sponsor of an attractive reasonably priced viewing aid—the COC Projection Table Viewer for 35-mm Color Slides. Weighing but 4½ pounds, the unit comes in a self-contained metal case measuring 6¾ x 11 x 3½ inches. The viewer's 6 x 6-inch non-breakable frosted plastic screen is set up in an inclined position for use. Slides are advanced into the viewing aperture by means of a lever-operated changer which is placed next to a finger-tip focusing lever under the inclined



COC viewer projects image on 6x6-inch inclined screen, is self-contained in metal carrying case weighing less than 5 pounds.

metal frame of the screen. Other essential parts of the viewer are a 50-watt T-shaped projection lamp, two light-condensing lenses, a 50-mm f/3.5 anastigmat projection lens and a 1st-surface mirror. Price: $34.50.

Phthalates for Drying. A method for producing extremely flexible emulsions which don't tend to curl with humidity changes and which retain so little moisture as to be almost dry after processing is outlined in British Patent No. 724,827 granted to R. H. Talbot and T. J. McCleary of Kodak 2/23/55 (applic. 4/1/52). Principal ingredient is ethyl-cellulose phthalate (or succinate or maleate) which is used as an ammonium (or sodium) salt. The silver halides are dispersed in a compatible peptizing agent such as starch acetate before they are mixed with the ethyl-cellulose phthalate. The use of a phthalate for dehydration purposes calls to mind Kodak's specification of phthalic anhydride in single-powder developers as a coating for deliquescent sodium and



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EASY TO USE
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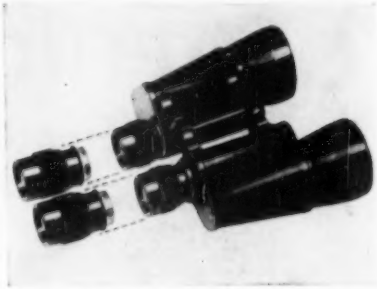
potassium hydroxide to prevent caking (U.S. Patent No. 2,649,376, granted 8/18/53, to Rasch, Henn, and Crabtree of Kodak)—T&T, April 1954.

7-12X Duplex Binocular. A recent news release from the United Binocular Co., 9043 S. Western Avenue, Chicago, Ill., brought us up to date on a new wrinkle in prismatic binocular design—an instrument which could be changed in a minute or so from 7x50 to 12x50 and back again. The simple secret is in the two pairs of interchangeable eyepieces supplied—one pair producing a 7X magnification and the other 12X. To make the change, you merely unscrew one set and screw in the other. Random use of the 7-12X Duplex Binocular produced satisfactory well-resolved images, free of fringing, with both eyepieces. There is no central focusing wheel, however—the left and right eyepieces must be focused separately. Weight is 33 ounces and height 7 inches. With the 12-power eyepieces in place, the field of view is 288 feet at 1,000



Binocular is changed from 12x50 to 7x50 by unscrewing 12x50 eyepieces and replacing with special 7x50 pair that come with unit.

yards and with the 7-power pair, 372 feet at 1,000 yards. This combination binocular is priced at $49.95 plus 10 percent tax, the package including a plush-lined leather carrying case, straps, and a special compartmented leather case for the extra set of eyepieces.

2 x 2-inch Super Slides. Burleigh Brooks, Inc., codistributors in this country of the Rollei camera line, have recently begun a bold campaign to broaden the popularity of 2¼x2¼ twin-lens reflex cameras for color-slide making. They recently began merchandising a kit consisting of a quantity of 2x2-inch fibre slide mounts with a 38x38-mm inside aperture, a 38x38 mask which drops over the camera's groundglass viewing screen and a similarly dimensioned film-gate mask that is placed inside the camera before the film is loaded. With the masks in place, 12 color transparencies can be made on a standard 120 roll of color film—suitable for screening with any ordinary 2x2-inch slide projector or for direct inspection in any standard 2x2-inch slide viewer (with the special mounts).

The system, which was worked up by technical director Frank Rizzatti of the B-B organization, is being offered to the public and also on an unrestricted basis to the industry at large. It was based on

the observation that far too many twin-lens-reflex camera owners use their equipment for black-and-white only. For some unaccountable reason, full-frame 2¼x2¼ inch color slides in 2¾x2¾-inch slide mounts have never been popular despite the availability of several excellent portable projectors accommodating this larger size. In addition, the exposure of 35-mm color film in the adaptation facilities provided for various twin-lens reflex cameras has not been adopted with any degree of enthusiasm. B-B's "super-slide" system makes use of the largest area that can be managed by standard 2x2-inch slide projectors without vignetting; for the dimensions of the double-frame 35-mm transparencies that are usually mounted in 2x2-inch mounts are 24x36 mm. Of course, a compromise of sorts is involved, for approximately 22 mm of usable film has to be trimmed off each of the four edges of the 2¼x2¼-inch film frame. Thanks to the square picture format and the relatively long focal length of the camera lens, however, the resulting 38x38-mm slide is extremely impressive without appearing to be a "telephoto view." The cost of these "super slides" is not out of line, averaging between 2 and 5 cents more than a standard double-frame 35-mm transparency in the same type of 2x2-inch mount. Incidentally, the risk of buckling has been minimized by designing the slide mount so that it holds down the transparency on all four sides with ¼ inch of film firmly gripped between the fibre lips on each side. We've seen a batch of sample super-slides projected and liked them immensely. If the public's reluctance to shoot 2¼x2¼ color is based mainly on the slide handling problem, Burleigh Brooks have come up with a winner and deserve the congratulations of all twin-lens-reflex camera users and manufacturers. Incidentally, the Super Slide Kit which includes a slip case along with the viewing and taking masks and 2 dozen mounts is priced at $4.95.

Odds & Ends. In a concession to available-light photographers who are obliged to utilize extremes of effective emulsion speed, J. L. Tupper and W. S. Grover of Kodak proposed in a paper read at the Boston PSA Convention last October that multiplying factors be applied to the ASA speed ratings of various films, depending upon the criteria of acceptability applied to the results. For "Best Quality" the factor would be 1x to 2½x; for "Acceptable Quality" 2.5x to 7.5x, and for "Threshold Quality" 7.5x to 15x. With forced development, these factors would necessarily be increased.

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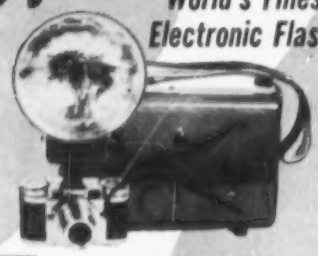

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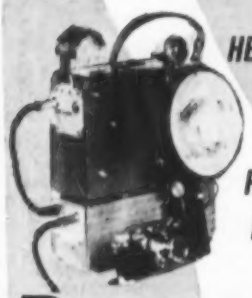

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REPORTER I

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color clinic

by David B. Eisendrath, Jr.

A famous technician solves your problems

I have studied all the information printed and have not been able to find the formulas for developing color film; everything I find says to use a developing kit. I have mixed my own chemicals for years, and do not want to change. Where can I find the formulas for color developers?—H. C. F., Brooklyn, N. Y.

Well, fellow, you certainly have us there. Both of the major manufacturers of color film in this country tell us that they sell developers in kits only and that some of the ingredients in color processing are so critical in their measurement and proportioning that unless they are compounded with extreme care and with properly preserved ingredients, you'd end up with no end of trouble. There are several people who market developing kits besides the film manufacturers, and they, too, agree that it's not a case of secrets as it is of precision mixing. Some of the old formulas have been published, but the manufacturers claim that the developing kits are constantly being modified as color formers are improved and emulsions are improved, and consequently, processing materials are adapted to this. Sorry to spoil your habits, but even if I had current up-to-date formulas and knew where to get all the chemicals in fresh lots, I'd still recommend that you stick to the manufacturers' recommendations. C. A. A. of Kansas City drops a card to say that he, too, dropped a filter on the pavement and when he found it had separated and had Newton rings in it, he discovered that by resqueezing it together he was able to eliminate them. Our only comment is that he was awfully lucky. Usually, laminated and cemented filters are damaged for good when they separate. This is why many professionals use solid optical-glass filters: they don't separate or discolor.

•

I am stumped by the washout of color in my sunset pictures. With one of our beautiful sunsets, the sky a ball of fire, dark red streaks on the clouds, etc., I shot at three seconds but when the picture was processed, the clouds were a pinkish yellow, and quite pale, although other objects in the picture had good contrast. Can you help me?—C. S. McL., Salt Lake City, Utah.

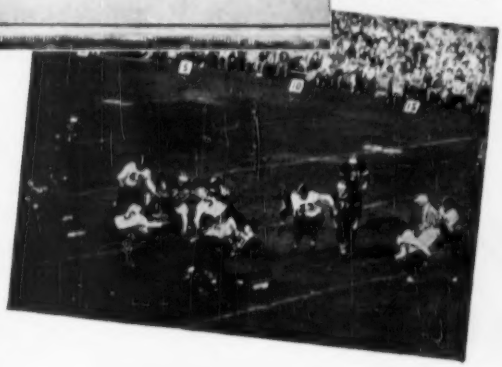
From your description, I think you made a couple of mistakes. I think your exposure was much too long, and also I think you made a mistake in expecting too much! When you make color pictures of landscapes and scenes with sunsets, you have a tremendous range of contrast and you will have to decide where you want your color and detail to be—in the sunset or in the ground detail. There's an old rule for sunsets that says, if you can look at the scene without squinting your eyes, you can get a good color picture of it. This means that the sun itself is partly covered by the clouds or an object on the horizon or dimmed by haze. However, if you will look at an exposure meter you'll see that the exposure necessary to get an exposure of objects in the foreground will be so long that proper exposure for them won't let you get a good exposure of the sunset. And a good exposure of the sunset will be so short that the landscape will silhouette in shadow.

Every sunset being different, of course, here are some sample exposures for sunsets: with the sky bright and the sun behind a cloud, but above the horizon, try 1/50 at $f/4$. If the sun is below the horizon, or clouds on the horizon, give a little more exposure, and if the afterglow is bright, you may try 1/10 at $f/2$, or 1½ seconds at $f/8$—and then bracket by making exposures half and then twice as long. I find that often a sunset that is slightly underexposed is more dramatic than one that has the exposure for true rendition; for the underexposure makes the colors darker and somewhat more theatrical.

Now, suppose you want to make a picture of a sunset but do not want to silhouette a subject in the foreground. I have successfully made pictures of people sitting or standing with sensational sunsets in the background by using the light of a blue flashbulb to illuminate the foreground subject. You just use the basic rules for synchro-sunlight flash pictures, but use the flashbulb as a main light. Let's say I want to make a picture of a girl in an average-color (not white, or dark) dress with a sunset background. If the sunset is such than an exposure of 1½ seconds at $f/8$ will give the effect we want, I know that my lens must be stopped to $f/8$. So I will take a blue flashbulb—let's say a #5B—and figure that for an open flash shot (same as 1/25 second) the factor is 45, I know that the bulb must be about 5½ feet from the subject. But wait a minute—I'm out of doors, and if there are no nearby walls to reflect the light of the bulb, I'm going to need a little more exposure. Ordinarily this would mean opening up the lens diaphragm a little—but we can't because it has to stay at $f/8$ to properly render the sunset. O. K. What do we do? Move the flashbulb in a little closer to the subject—say four and a half to five feet. It works, because I've done it often. Sold the pictures, too!

Questions of general interest to the color photographer will be answered in this department. However, individual replies can not be given for questions that are not used.—Ed.

Atop stadium roof. Mason (Right) works his Exakta while other photographer uses a "Big Bertha" with 20 inch lens. Along with the operator of the Big camera a spotter is necessary to record the plays.



University of Conn.—University of Maine Game, taken with an Exakta from stadium press-box. 500th of a sec. at f:8. 135mm lens.

You can photograph it easier with an Exakta!

Newspaper photographer Wesley L. Mason gets thrilling, close-up action-packed football shots the EASY way with his 35-mm Exakta. "He gets such amazing results that other photographers sit up and take notice."*

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*This is directly from an article by Arthur J. Kiely, Jr., Sports Writer for the Hartford Courant.

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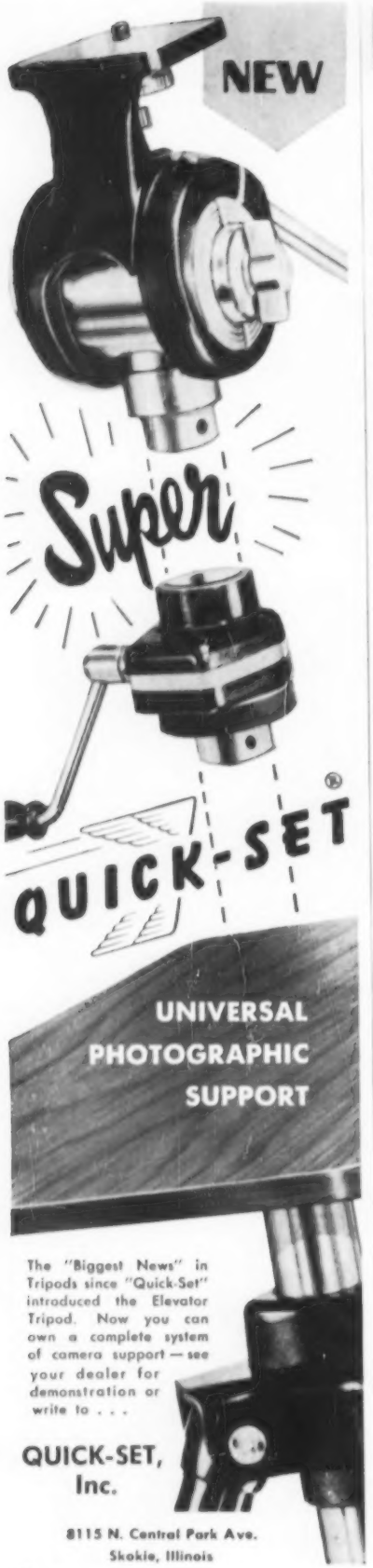

legal problems in photography

Transportation of Obscene Pictures Across State Lines

If you have occasion to travel across state lines (and who doesn't?) heed this warning! Don't make a Federal case out of it!

A loophole in the Federal law large enough to slip a car through was plugged up by Congress this past summer. Strangely enough, the law for many years prohibited the transportation of obscene matter through the mails and by common carrier, such as express. But there was never any ban on transporting such matter by private car. As a result, the law was easily evaded by the use of a private car. Now, that is changed. In addition, the definition of obscene matter has been broadened and a peculiar provision inserted in the new law that if you're caught with two or more copies of obscene matter, such as pictures, or a combined total of five items including pictures and other obscene articles, you are presumed to be transporting them for purposes of sale or distribution, which constitutes an offense, punishable by a fine up to $5,000 or up to five years in jail or both.

Let us look at the pertinent parts of the new law.

> Whoever knowingly transports in interstate or foreign commerce for the purpose of sale or distribution any obscene, lewd, lascivious or filthy book, pamphlet, picture, film, paper, letter, writing, print, silhouette, drawing, figure, image, cast, phonograph recording, electrical transcription or other article capable of producing sound or any other matter of indecent or immoral character, shall be fined not more than $5000 or imprisoned not more than five years or both.
>
> The transportation as aforesaid of two or more copies of any publication or two or more of any article of the character described above, or a combined total of five such publications and articles, shall create a presumption that such publications or articles are intended for sale or distribution, but such presumption shall be rebuttable.

Note also that it's up to you now to prove that the pictures are not intended for sale or distribution. In other words, under this provision you are in effect presumed guilty until you prove you are innocent, instead of its being the other way around.

Bearing in mind that nudes can't be divorced from the subject of obscenity, this becomes a serious matter for all those who either send or carry across state lines any pictures or film which are in the slightest way questionable.

Unfortunately, the new law still doesn't settle the age-old question as to which pictures are obscene and which are not. As explained in our previous columns, a picture of a nude might be proper if sold through normal channels of art. Yet, the same picture in a book shop specializing in the sale of lewd material to disreputable characters might be classed as obscene. It therefore becomes apparent that the identical picture when being transported across state lines becomes a source of danger to the person transporting it.

This imposes a grave responsibility on the person taking the pictures across the state lines. While it is aimed at those selling pornographic material, think of the fellow who happens to have in his pocket a few pictures of nudes which his friend might have brought him from France. He might have quite a time convincing the officials as to his innocent intentions. It is almost like the Mann Act, which makes it a Federal offense to transport a female across state lines for immoral purposes, except here the female is but an inanimate image on a film print, or picture.

Why was the law changed? To get after those who deal in pornographic material and to reduce juvenile delinquency. So says the report of the Congressional Committee which recommended the law. Part of this record reads as follows:

> Traffic in obscene literature has been conclusively shown to be a corrupting force contributing to juvenile delinquency. The following editorial from the *Philadelphia Inquirer* of May 25, 1955, is indicative of the public demand for control of this traffic:
>
> SMASH THIS FOUL TRAFFIC
>
> Among the more loathsome activities of the criminal world is the traffic in lewd books and pictures. Two shocking facts are coming to light about it.
>
> Where once this foul business was aimed principally toward a comparatively limited number of evil-minded adults it is now being concentrated in wide distribution among juveniles.
>
> Worse still the dirty-picture racket is growing, and to an enormous extent.
>
> Such information was developed yesterday in New York in background evidence presented as Senator Kefauver and his Senate Subcommittee To Investigate Juvenile Delinquency opened hearings on the distribution of pornography.
>
> Peter N. Chumbris, associate counsel of the committee, reported its scope and increase as the result of investigations in 20 cities and from questionnaires sent to police chiefs in more than 500 areas.
>
> A significant aspect of the growing traffic has been a corresponding increase in sex crimes. Its association with other forms of juvenile criminality is patent and it is hoped the subcommittee's inquiry will bring that to sharp focus and with it the need for determined efforts by parents, as well as police, to smash this filthy trade and put those concerned in it behind bars. It is something that cannot be ignored. And it can be smashed.
>
> It is obvious that there is a pressing need for legislation to prohibit transportation by private conveyance. The committee is of the opinion that the new section 1465 proposed by this bill will provide the means of closing the present loophole in the law.

It is difficult to take issue with any measure having such wholesome purposes.

(*Continued on page* 93)

announcing!

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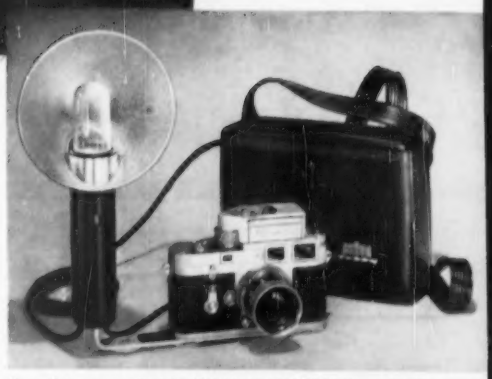

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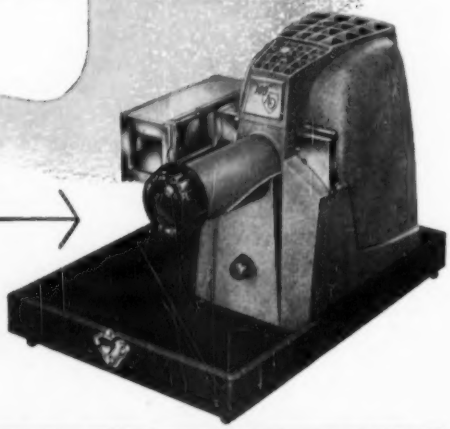

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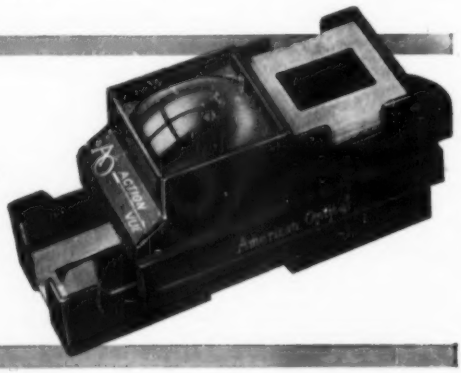

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Many ask us . . . "just how does the average photo fan know which brand of filter to buy?" That's a pretty rough one to answer, being prejudiced of course. But we try to point out a few of the things that the eye can't see, but the film does.

For one thing, we all know that a filter is supposed to change the color of things . . . that is, it changes the color of the light reflected off the subject, to balance it to the film's color characteristics . . . or to create certain toned effects. But, while it changes COLOR, it should not change the SHAPE! That's where plano-parallelism comes in. This means, simply, that the two sides of the filter are perfectly parallel, and flat . . . an often mis-quoted term. And if your filter isn't plano-parallel, it's like adding another element to your lens. This raises havoc with a delicately balanced optical system that you pay so much for. The result . . . distortion!

THEN THERE'S COATING. There are all sorts of "coatings" . . . they all look alike . . . but, the best coating any lens (and certainly, filters) can have is a tough (T) coating that kills glare and also protects the finely polished glass surfaces!

AND HOW ABOUT THAT THING CALLED "TRANSMISSION CURVE"? Most filter makers actually shy away from the term . . . because it's the toughest test of all! Some filters don't even carry a numerical designation similar to the film manufacturers' specs . . . because they don't want to be held up for comparison. As a matter of fact, these filters, particularly the so-called "solid glass" type, actually vary from filter to filter . . . like "dye-lot" woolens! So how do you know what you've got?

In filters, the integrity of the manufacturer is probably the only safe way to make your choice. And if you check, you'll find that Tiffen is, bar none, the world's largest manufacturer of filters and lens accessories. No wonder that Tiffen is distributed coast to coast by the finest dealers in the nation . . . with a Lifetime Guarantee that has "no strings attached"!

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camera clubs

by Whit Hillyer

Quantitative Analysis Revisited

Those who saw the October column will recall my examination of the "Who's Who" movement in amateur photography. Can it be Art, I asked, when you have one hand on the adding machine?

The most thoughtful response to this query came from Urban Allen, one of the most active amateurs in the Hawaiian Islands. Urban is a newspaperman by profession. He's a clear thinker, a very pleasant guy, a good photographer, and a real friend of amateur photography. Wish there were room for his entire letter—but even the following excerpts will prove enlightening.

In today's frantic amateur competition for national recognition, Urban says, "Art is only incidental. The object is to roll up the total. It's a trophy chase. If pictures have to be Art to win, then the makers will strive to make them Art. If something else is acceptable to the salon judges, the makers will deliver whatever the fashion dictates.

"You can't liken the average camera clubber to the hungry Van Gogh, driving himself mad to get his ideas on canvas, or to Rembrandt van Rijn, defying his patrons in order to produce pictures that would satisfy his artistic integrity. . . .

". . . I think the important thing is not to worry too much about numbers, or the foibles of the salons—but to ask if each photographer is enjoying what he is doing, if he is doing it for recreation, or making the most of his talents, if he has more serious motives.

"Of more serious concern to me is the . . . gloom, grain, and blur that is fashionable with one small segment of the camera crowd. Large amounts of this sort of thing finally drum into the head of the young photographer the idea that technique, good quality, careful composition, and the rest aren't necessary if you can louse things up enough to shock. . . . I'd like to recommend that for every excursion into the gloom of available light there be an excursion into nature's wonderland of trees, hills, and meadows . . . I think we will, as John Adam Knight suggests, soon pass out of this gloomy, melancholy phase and emerge into God's good, clean light again. . . ."

So I share Allen's concern for technical quality and pictorial subject matter, and he shares my opinion of picture production for production's sake. I'd have liked to publish word from the Opposition, but nobody popped off! A pity, really. Anyhow, thanks, Urban, and Aloha.

Technique Tested on the Spot

At one of its regular meetings recently, *Hazelton* (Pa.) *Camera Club* conducted a competition which demonstrated individual members' originality and ability. Each member present was sent into a room by himself, being allotted 10 minutes in which to arrange, light, and photograph a composition with a Polaroid Land camera. Finished prints were available promptly, of course, and were immediately presented to the group for comment, criticism, and advice.

Camera and film were furnished for the occasion by a *Hazelton* clubber who runs a local camera shop. According to club secretary John Shelby, the group rated the program highly, both as education and as entertainment. Another similar program is planned, this time with a live model.

We hear that Ray Moss once again has been elected president of *Metropolitan Motion Picture Club, Inc.* (New York). His re-election is tribute to his popularity and his ability as an administrator. Congratulations!

The outstanding success of the 8th annual convention of *Camera Club Council of Hawaii* is typical of the photographic progress being made out that way. The dealers now have formed a Hawaii division of the Master Photo Finishers and Dealers Association, and a PSA chapter is in the process of organization. The *F/16 Cameralists* gave quite a reception to Harry Shigeta's Japan-bound camera tour when the group stopped off en route westward.

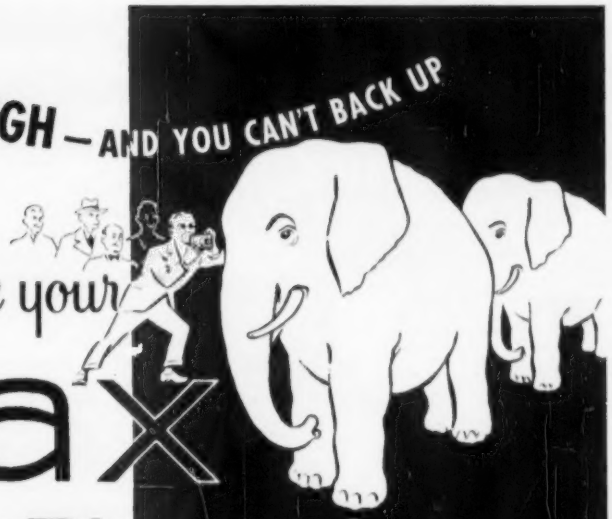
Pleased to start receiving the "CICCA Courier," official bulletin of *Central Illinois Camera Clubs Association*. This is a group of 23 clubs, whose correspondent is Mrs. Evelyn M. Robbins, 2417 South 11th St., Springfield, Ill. In the past I've taken cracks at local "honors" to be awarded photographers by clubs and club councils. At least CICCA has a refreshingly new twist on this. Instead of the overworked Associate and Fellow designations, they accord deserving individuals F/64, F/32, and F/11 honors. And "Courier" editor Sewell Wright, in musing about what became of the F/22 designation, concludes that mebbe they reserved it for judges who don't know good prints and slides when they see 'em. Such folks would more appropriately merit an F/0.5 rating, in my opinion.

Having recently celebrated its 57th anniversary, *Photographic Guild of Philadelphia, Inc.*, is sponsoring photographic activities open to the public. The club's 20-page pocket-size program is available upon request, and might give a lot of you some good ideas. Address the secretary, at 3140 Market St., Philadelphia 4, Pa.

Chicago Area Camera Clubs Association's "Association News" came out this autumn in a very readable letterpress version. Very nice job, and a fitting celebration of CACCA's 20th anniversary.

Is your club on our mailing list? If not, please send name and address to: POPULAR PHOTOGRAPHY, Department 307, 366 Madison Ave., New York 17, N. Y.

WHEN IT'S WIDE OR HIGH—AND YOU CAN'T BACK UP



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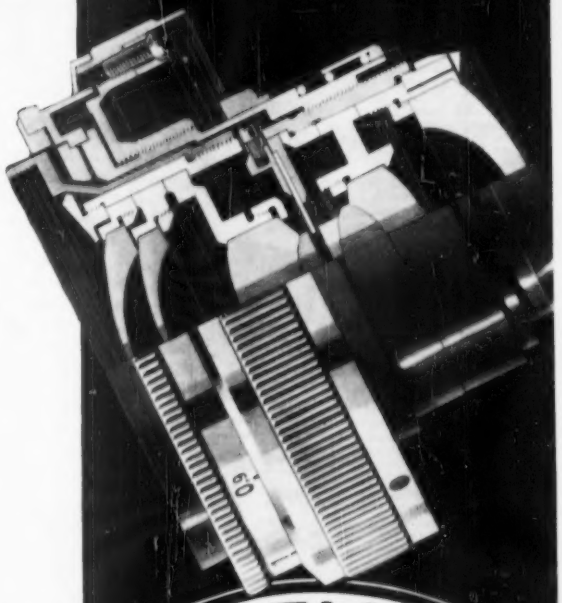

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35-mm today

By Bob Schwalberg

Camera and Darkroom Controls for Photographic Tests

Last month we began a series of columns concerning the problems involved in running practical photographic tests to discover and analyze the properties of photographic materials, weigh the relative merits of competitive products, and also help solve personal problems in technique. The useful and rewarding experiments which any conscientious photographer can perform with his own camera and in his own darkroom require a minimum of theory and absolutely no complicated laboratory equipment or techniques.

They do, however, demand that we recognize certain basic principles. Chief among these is that we limit each experiment, insofar as this is humanly possible, to only one unknown quantity or variable. The validity of any test depends, then, upon our ability to control every factor save the one we're trying to discover or analyze.

Last month we just about managed to list the first three important test controls. (1. *Subject Controls*, 2. *Lighting Controls*, and 3. *Exposure Meter Controls*) when the proprietors of this space brought the discussion to what, in military parlance, is known as a screeching halt. And so, let us return to the wars.

4. *Camera Controls*. The camera distance and angle relative to the subject must not be allowed to vary more than slightly during the exposure of a series of test negatives. A tripod with a strong head will help insure that it doesn't. If several rolls of film are to be exposed in succession, one of those snap-on-snap-off tripod gadgets will accurately reseat the camera after reloading.

Before shooting it is advisable to have a qualified camera repairman (rare bird, he!) run a check on your shutter speeds. In even the most costly cameras, indicated speeds will frequently vary considerably from what they should be. About the best we can hope for in this cruel world is consistency. If our 1/50 is *consistently* 1/42, well and good, but if it's sometimes a 1/59, test negatives may show frustrating inconsistencies. If we make it a standard operating procedure to repeat each test exposure a number of times—say five or six—we can further guard against accidental error from this source.

It is imperative that as far as is possible (except when other considerations interfere) we should stick to one of the middle-range shutter speeds between 1/10 and 1/100. There are several important reasons for this.

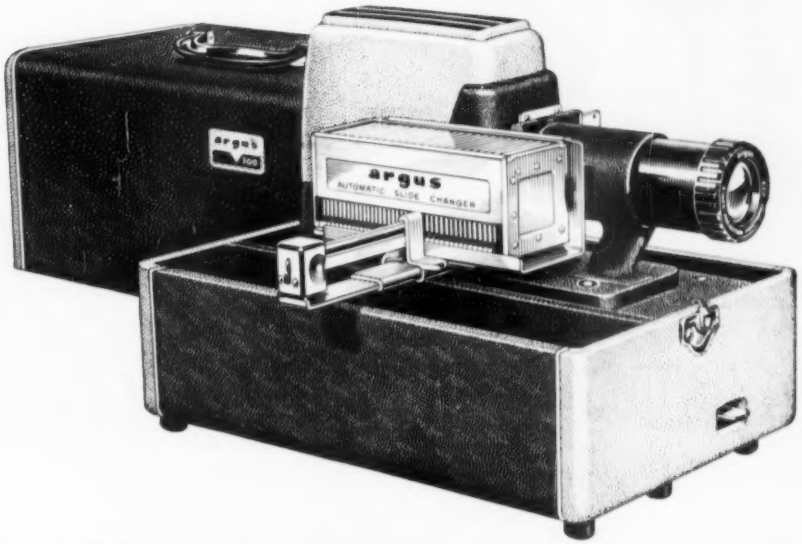
If we use very long or very short exposures we run the risk of becoming involved with that most infamous photographic bugaboo—Reciprocity Failure. The law of reciprocity tries to tell us that the photographic effect of an exposure is equal to the product of light intensity and shutter time. If the light intensity remains fixed, one might suspect that a 1-second exposure would be fifty times more potent than one of 1/50 second and, further, that an exposure at 1/1,000 second would be twenty times *less* effective than the 1/50 exposure. And, sometimes, with some films this is true, or pretty nearly true. But very often it is quite false, and for some mysterious reason very fast and very slow exposures produce less photographic effect on the negative than we would expect. In practical terms this could mean that nominally equivalent exposures of ½ sec at *f*/32, 1/30 sec at *f*/8 and 1/1,000 sec at *f*/1.4 might produce noticeably different densities on the negative or color transparency.

Another reason for avoiding the extreme ends of our shutter-speed scales is reduced accuracy and efficiency. This is true of very slow speeds, but especially true of very high speeds like 1/500 and 1/1,000. From the point of view of maximum shutter accuracy and efficiency, as well as to avoid reciprocity entanglements, it is best to use the 1/25, 1/50, or 1/100 for tests involving the comparison of relative density and contrast.

Wherever possible, only one shutter speed should be used throughout an exposure series, and the exposure regulated by means of the lens diaphragm. Of course, different lenses do not pass the same amount of light at the same apertures (and even successively larger *f*-stops in the same lens may not exactly double the light transmission as they should). From a practical point of view, however, these differences become appreciable only at fairly large openings like *f*/2 and *f*/1.5, and even here they are usually slight. In addition, as long as each roll of negatives

Development latitude test with Tri-X exposed at ASA 800. Roll cut into strips developed together for 12, 15, and 18 minutes in Microphen at 68 F with intermittent agitation. All conditions identical, including print exposure and development on No. 2 paper; immersion times are the sole variable. This kind of test really tells the story clearly, from practical point of view.

Protects your precious color slides from "dog-earing," dirt, heat, finger-smudging!



$66.50 complete

New argus automatic 300 watt projector

Treasured color slides that preserve precious memories for you *deserve* to be treated with extraordinary care. And that's the kind they get from the new Argus Automatic. It encloses each slide in an individual protective aluminum frame that locks out dog-earing, dirt, and finger-smudge damage forever.

And once you've loaded the individual slides into the magazine, you need never again touch them. A simple push-pull of the lever shows, changes, and safely stores them—automatically. During the longest show a powerful, built-in blower and special heat-absorbing condenser lens protects slides from heat, keeps them constantly cool.

The brilliance of the 300-watt picture is screen-wide, with no washed-out corners or spots. The full-focusing, wide-angle f:3.5 lens gives a big picture even in close quarters. Carrying case holds enough magazines for a two-hour show. Including projector, case, automatic changer, and one 36-slide magazine—$66.50.

argus C-3 $66.50

Features the Cintar f:3.5 lens, shutter speeds to 1/300, lens-coupled rangefinder, plug-in flashgun. Interchangeable telephoto and wide-angle lenses make it extra-versatile. With case and flash, only $66.50. (Extra lenses, $49.50 each.)

argus C-4 $84.50

America's most distinguished 35 mm. camera has a Cintar f:2.8 lens—gets the picture even in dim light! Rangefinder and viewfinder combined in one window, lets you focus as you compose. Flashgun locks on camera. Only $84.50. Carrying case, $7.50. Flash, $7.50.

New argus *"instant-reading"* light meter $16.95

Instantly and without figuring, provides direct setting data for incident and reflected light. Just set film speed and read—the correct f:stop from f:1.4 to f:22, the shutter speed from 1/1000 second to 2 minutes. Includes leather case, only *$16.95*.

Argus Super-Sensitive booster attachment for a super-accurate reading in dim light. Plugs into Argus Light Meter. With leather case, only *$7.95*.

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Argus Cameras, Inc., Ann Arbor, Michigan (Canadian address—Toronto 1, Ontario) All prices subject to change without notice.

105mm f2.5 Telephoto

2 NEW NIKKOR LENSES *that are causing a sensation in the 35mm field!*

It is amazing how quickly a 'good thing' will 'catch on' . . . and these two new Nikkor lenses certainly deserve the reputations they have been making for themselves.

Take the *105mm f2.5 Telephoto*, for example. The focal length is double that of the standard 50mm camera lens. This means that it gives you 2X magnification or twice the image size – ideal for hand-held shooting. Now consider its speed – f2.5 – and you can understand why it is regarded as the perfect telephoto for Available Light Photography. With the new ultra-fast films and this lens, there is hardly a light situation which can be called 'impossible'.

25mm f4.
Ultra Wide Angle

The *25mm f4 Ultra Wide Angle* is another instance of good design planning. Its focal length is half that of your standard lens so that it covers four times the field area. Its speed of f4 is the fastest available in this category. And it is even faster than apertures would indicate because the 25mm f4 is a specially designed 4-element lens and transmits more light than the usual 6 or 7-element lenses now being offered in this category.

But focal length and speed are only part of the story. Sharpness and definition are still the important qualities of a lens. High resolution and high speed have become the mark of *all* Nikkor lenses . . . and Nikkor another word that means lens quality. Your first experience with these lenses will amaze you. Both the 105mm f2.5 and the 25mm f4. are available for Leica-type screw mounts as well as for Nikon cameras – they couple to the rangefinders and are supplied with Matching Lenshood/Filter Holder.

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receives the same diaphragm treatment, these minor discrepancies will cancel each other out and, in any case, we run far less risk in trusting the diaphragm than if we were to rely upon the shutter.

Still another way to regulate camera exposure for test purposes involves the use of only one lens stop and shutter speed throughout, exposure being regulated by means of graduated neutral density filters. In my own experience, and in spite of their scientific elegance, neutral density filters do not appear appreciably more accurate and involve complications of their own.

Quite aside from this, it is a fundamental of practical testing that you never get complete answers from a single test. By the time you've made a number of related experiments at different lens stops, shutter speeds, or even with different cameras and lenses, this variable will also cancel itself out for all practical effect.

5. *Processing Controls.* Any carefully conducted test from a film-speed to a flash-guide-number test can be reduced to meaninglessness by faulty film processing. Some things are obvious. All solutions should be at the proper processing temperature. For black-and-white this means 68-70 F, unless otherwise specified. A print tray full of water at the correct temperature becomes an efficient water jacket. Both timer and thermometer should be of good quality. Timers can easily be checked against a watch or clock, but only two thermometers will insure safety in the temperature department. (I can hear some joker asking what you do when the two thermometers read differently. When this happened to me I bought a third and now operate democratically, by majority vote.)

Agitation is another vital factor in processing which can throw a whole test out of kilter. Over-agitation increases contrast because an excess of fresh developer is fed to greedy highlight areas. Under-agitation starves these heavily exposed areas where developer solution is rapidly exhausted and creates flat contrast. Ideally (and this applies equally to any kind of development), agitation should be given uniformly at regular time intervals throughout the development. A good policy is to give the film (or tank) a fixed number of shakes or twirls every minute or every other minute until development is complete. The important thing is to keep your agitation uniform without being perfectly mechanical about it as this can easily result in development streaks.

Plastic pour-in-pour-out-type developing tanks in which all three solutions—developer, shortstop, and hypo—enter and leave through one common spout are not ideal for test development because of the time lag in flooding the tank with developer and then emptying it. If you do use this type of tank you might try to obtain additional vessels for the shortstop and hypo. With these ready, you can insert your loaded film reel rapidly into a tankful of developer, remove it quickly when the time is up, and pass it into the shortstop with a minimum of delay. Testing aside, this rapid insertion and removal of the film from solution to solution should

(*Continued on page* 93)

Make this the *Brightest Christmas*

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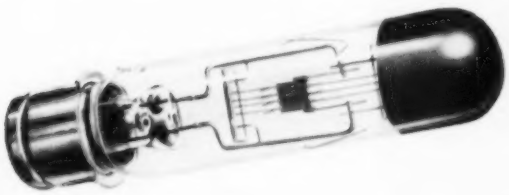
Give Sylvania Flashbulbs in the new gift package

20 all-purpose Press 25's to help keep the bright Christmas spirit in memorable pictures.

And, for your color pictures, have a good supply of 25 B's on hand. First choice with amateurs and professionals alike, famous "Blue Dot" flashbulbs *outsell all other brands combined.*



Perk up your Christmas slide and movie showings with the NEW Sylvania *Ceramic* Blue Top Projection Lamps. Brighter . . . cooler . . . longer lasting . . . these revolutionary new lamps show your pictures at their brilliant best. Don't wait 'til a "burn-out" spoils the fun—get a spare for your projector today.

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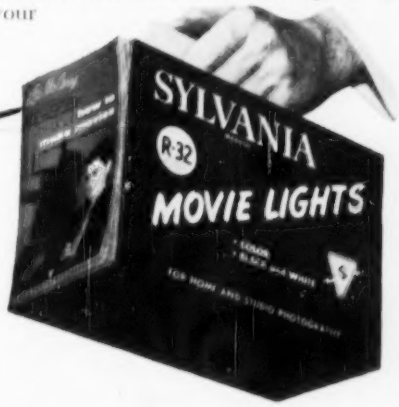

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what's new — Trade Notes and News

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CAMERAS & ACCESSORIES

HANIMAR 88 (see this column Sept., 1955 issue), priced at $61.85, includes camera, normal f/2.8 and interchangeable 70-mm f/6.3 lenses, and case. Distributor is Hanimex (USA) Inc., 593 Market St., San Francisco 5.

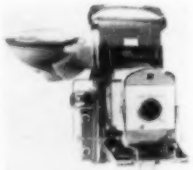
GRAPHIC 70 is now available in a limited number. Taking 70-mm film in cassettes, it produces 50 frames, 2½x2¾ in. Rapid-transport mechanism allows ten exposures with one winding. Parallax-corrected range-viewfinder couples to normal and interchangeable lenses, which accept one-size filters. Among other features are 4-in. Kodak Ektar f/2.8 lens in focusing mount; nylon focal-plane shutter; nine speeds from 1 to 1/500 sec; pistol grip; shutter release at rear; slicing knife to remove partially exposed film; exposure counter; and automatic number recording on film. Price of $1,850 also includes carrying strap, five filters, eight film cassettes, B-C flashing unit, cable release, and aluminum carrying case holding the above plus extra lenses and flashlamps. Lenses available are 8-in. Kodak Ektar f/4 long-focus, $550, and 2½-in. Kodak Ektar f/4.5 wide-angle, $920. Manufacturer is Graflex, Inc., 154 Clarissa St., Rochester 8, N. Y.

PEN-PIC is a fountain-pen type camera. Featured are a 1/50 sec shutter speed; two-element f/6.3 lens; three lens openings; exposure counter; 10-mm-sq. negative size; and pocket clip. Distributed by Cinema Lens Co., 277 Broadway, New York 7, price is $19.95 ppd. incl. one 18-exposure 16-mm cartridge; extras available at 75 cents per cartridge.

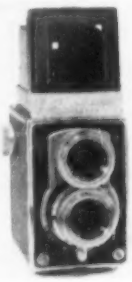
STEREO GRAPHIC uses an optical system known as Depthmaster Auto-Focus. At widest aperture one lens is positioned to focus automatically from near-foreground to about 30 ft, the other from about 15 ft to inf. The slides are said to appear in sharp focus from foreground to infinity when seen through a viewer. A diaphragm selector for four light conditions eliminates aperture setting by hand. Film winder cocks shutter, permanently set at about 1/50 sec. Film counter indicates remaining exposures. Price of $79.50 includes flashing unit and leather case. Battery illuminated viewer with dual focusing for either hand and eye-width adjustments is $12.95. Manufacturer is Graflex, Inc., 154 Clarissa St., Rochester, N. Y.

ALPA 35-mm single-lens reflex cameras are now available with 40-mm Macro-Kilar f/3.5 lenses. Model E and Model D focus down to 4- and 2-in., respectively. Alpa 4 (straight reflex) Model E is priced at $244; Model D, $269; Alpa 5 (prism reflex) E, $314; D, $339; Alpa 7 (prism reflex plus rangefinder) E, $354; D, $379. Distributor is Karl Heitz, 480 Lexington Ave., New York 17.

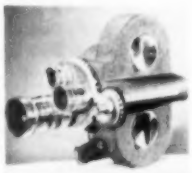
PRICE REDUCTIONS on TDC Stereo Realist cameras are announced by TDC Div. of Bell & Howell Co., 7100 McCormick Rd. New prices are: Colorist, $69.50; Vivid, $129.50; presentation packages with either camera, viewer, flashing unit, and carrying case are priced, respectively, at $109.50 and $178.



THE 700 is the name of the latest addition to the camera line of Polaroid Corp., Cambridge 39, Mass. Besides a rangefinder, it features a bracket for straight-on flash and bounce-flash, claimed to make possible more-natural-looking flash pictures. Universal flash guide for all Polaroid films, heavy-duty shutter; 3¼x3¼ picture size; and new front plate are also featured. Price is $125; Powerflash B-C unit, $15.95; and compartment case is $24.95.



SOLIGOR SEMI-AUTO is a twin-lens reflex camera similar to the Soligor Reflex, described on page 144 of the October 1955 issue of POPULAR PHOTOGRAPHY. Additional features are nine shutter speeds from one to 1/300 sec; a built-in self-timer; and a semi-automatic film winder. Priced at $59.95, the camera is distributed by Interstate Photo Supply Corp., 17 W. 17th St., New York 11. More information available.



70-DR is the latest addition to the 16-mm Model 70 movie camera of Bell & Howell Co., 7100 McCormick Rd., Chicago 45. It features a viewfinder coupled to lenses on turret; seven speeds; 22-ft film run; 100-ft capacity; forward-reverse hand crank. Turret lenses range in focal length from 10-mm to 6-in. Prices: with 1-in. Comat f/2.5 lens, $361.50; with 1-in. f/1.9 lens, $385.50; with 1-in. Ivotal f/1.4 lens, $474.50; and with 1-in. Angenieux f/0.95 lens, $508.05.

EASTMAN KODAK CO., Rochester 4, N. Y. announces two new movie cameras. Brownie Turret f/1.9 is an 8-mm model with a 13-mm f/1.9 lens and a three-position turret housing 24-mm telephoto and 9-mm wide-angle converters and the standard lens barrel. When turret is rotated, focusing or resetting for exposure is unnecessary. Barrels are marked to indicate minimum distance at each lens opening to f/16. Finder is marked for each field of view and an exposure guide is built in. Medallion is an 8-mm magazine loading Cine-Kodak model. Equipped with a standard D mount focusing down to 12 in., it takes interchangeable lenses and a 25-ft magazine of film. Zoom-type optical finder shows field of

view for lenses from 6½- to 38-mm; has parallax-allowance indicators; three-position eyepiece; and a focal-plane marker for accurate focusing. Shooting speeds range from 16 to 48 frames per sec. Both cameras feature a red-dot system indicating finder setting, frames per sec, lens position, and exposure. Prices are, respectively, $79.50 and $144.50, federal tax included.

HULCHER 70 Model 102 is a rapid-sequence press camera producing 2¼x2¼ negatives at rates of from 5 to 20 per sec on 70-mm film. Featured are adjustable focal-plane disk-type shutter; speeds of from 1/25 to 1/2880 sec; automatic-reflex housing; quick-change lens mounts taking lenses in focal lengths of from 3 to 80 in.; 12-volt battery for electric power although camera may be supplied to operate from other voltages; 470 exposures on a 100-ft roll of film. Price of $1,250 includes 6⅝-in. Wollensak Raptar f/4.5 lens in focusing mount. Write Charles A. Hulcher Co., Inc., 40 Manteo Ave., Hampton, Va., for price list of accessories.

ALPA 35-mm single-lens reflex camera is now available with a 50-mm Kern Switar f/1.8 Apochromat lens with an automatic diaphragm. With clickstops ranging to f/22, prices start at $349. Distributor is Karl Heitz, Inc., 480 Lexington Ave., New York 17.

GNOFLEX is a semi-automatic twin-lens reflex featuring automatic film stop and counter; nine shutter speeds from one to 1/300 sec; built-in self-timer; depth-of-field scale; and a 75-mm Elnor f/3.5 lens. Film size is 120. Distributed by The Meyer Co., 315 Chestnut St., South St. Paul, Minn., price is $59.95.

SPEED TRIPOD for all cameras from 35-mm to Speed Graphic size is announced by Graflex, Inc., 154 Clarissa St., Rochester 8, N. Y. Camera is dropped onto a "guide-on" shoe on tripod head after a metal shoe is attached to tripod socket on camera. Tripod has an 18-degree tilt in addition to normal panning and tilt operations. Legs are single-extension and maximum height of 67-in. is achieved with a double-extension center post. Retainer straps hold legs together and attach tripod to gadget bag. Weight is 4½ lb and price is $19.95.

LINHOF DeLUXE all-metal stand accepts all cameras from 4x5 to 8x10 size. Featured are: hand-crank-operated geared center column permitting elevation from 32 to 56 in. and to 80 in. with an extra geared post insert; 360-degree rotation; built-in padded shelf for accessories; built-in casters for operation by operator. Price is $299.50 through Linhof dealers. Distributor is Kling Photo Corp., 235 Fourth Ave., New York 3.

PRINCE is the latest addition to the Whitehall tripod line of Quick-Set, Inc., 8115 N. Central Pk. Ave., Skokie, Ill. An elevator model with a 14-in. rise, it features two-way control by hand-crank or manually pushing the column up and down; spring-positive brake-lock at any height with a

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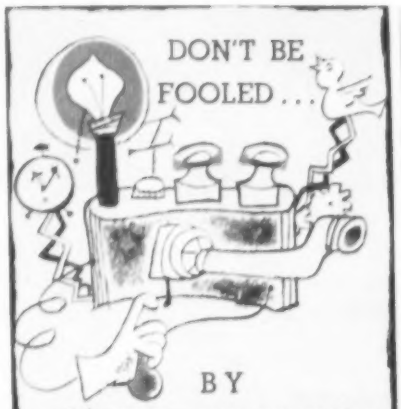

BY

GIMMICKS!

This contraption is good for laughs, but not for pictures. Some cameras get your interest with confusing, "do-nothing" gadgets that make you think you're getting a lot of camera for your money. But to pay for the trimmings, they leave out the "guts" . . . because something's got to give to keep the price attractive. If you want a camera designed with just one thing in mind, producing fine pictures . . . look at Konica!

A few of Konica's "working features"

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IN CANADA: McQueen Sales Co. IN VENEZUELA: C. A. Yayewa & Cia.

quick release for fast adjustment; telescoped length of 21¾ in. extending to 68 in., and weighs 3½ lb. Price is $19.95.

MACRO COPY is designed for photocopying and macrophotography use with Nikon cameras and Nikkor lenses. The outfit consists of a copier unit, sliding arm, upright post, base clamp, extension tubes, micrometer focusing mount, and a portable hardwood fitted case which houses the unit when disassembled, doubling as baseboard to which the base clamp is attached. Unit price is $175 but elements can be purchased separately. Distributor is Nikon, Inc., 277 Fifth Ave., New York 16.

MINOX COPYING STAND consists of a camera clamp with cable-release socket and four adjustable three-sections legs notched for settings to 8, 10, 12, and 18 in., corresponding to distance settings on Minox cameras. Intermediate adjustments can also be set. Price is $29.50. Special Minox ASA 5 Micro-grain Copy film is available at two cartridges for $2.50. Distributor is Kling Photo Corp., 235 Fourth Ave., N. Y. 3.

MAYPOLE CLAMPLAMP CO., 727 Delaware Ave., Youngstown, Ohio, announces two aluminum clamping units. A unipod weighs 27 oz. telescopes from 30 to 60 in. with only one adjustment and supports cameras up to five lb. in weight. A clamplamp with the same basic specifications has a gooseneck top accommodating interchangeable reflectors and revolves 360 degrees. Clamps have four in. of travel. Prices are, respectively, $10.95 and $17.95.

LENSES & ACCESSORIES

PHOTAR CLOSE-UP lenses in +1, +2, and +3 sizes are available in Series #8 ($12.50) and Series #9 ($15). Manufacturer is Tiffen Marketing Co., 71 Jane St., Roslyn Heights, L. I., N. Y.

AUXILIARY WIDE-ANGLE lenses in matched pairs for stereo cameras are announced by Spiratone, Inc., 49 W. 27th St., New York 1. They are color-corrected, come equipped with filter holders, and with a fixed-focus setting of about 3½ ft all subjects to infinity are well covered. Price is $29.95, including a lined leather case.

ASTRAGON long-distance lenses are announced by Sterling-Howard Corp., 561 E. Tremont Ave., New York 57. Available in six focal lengths from 300 to 1000 mm, features include aluminum-alloy construction; aperture stops to f/22; top and bottom engraved aperture scales; mirror-reflex housing; 25-power critical focusing magnifier; calibrations marked in feet; built-in filter slot; and focusing wheel on lenses from 500 mm up. Prices start at $129.50.

REDUFOCUS Wide Angle Lens Units are four-element coated lenses for use on stereo cameras. Covering a 68-degree picture angle, they do not affect aperture of normal lenses. Compensating viewfinder shows the new image, provides for necessary changes in distance and parallax, and attaches to camera base with retaining screw provided. Price of complete unit, incl. compartment case and carrying strap, is $119.50. Distributor is C. A. Steinheil, 705 Bronx River Rd., Bronxville 8, N. Y.

ST-513 is a wide-angle lens attachment for Stereo Realist-41 and -42 cameras, and is claimed to increase the width of coverage by 40%. Twin-lens barrels are made of anodized aluminum with 25-mm-focal-length four-element lenses and fit over the camera's normal lenses. Price, incl. leather-lined case and parallax-corrected optical viewfinder, is $119.50. Manufacturer is Realist, Inc., 315 W. Court St., Milwaukee, Wisc.

FUJINON lenses are announced by D. P. Bushnell & Co., Inc., Pasadena, Calif. The 50-mm Fujinon f/1.2 lens is priced at $369.50 and the 35-mm Fujinon f/2 lens, claimed to be the fastest wide-angle lens available, is $199.50.

INTERSTATE PHOTO SUPPLY CORP., 17 W. 17th St., New York 10, announces two lenses for movie enthusiasts. The first is the 25-mm Elitar-Soligor f/1 for 16-mm cameras with C mounts. It features helical focusing from 2 ft to inf. and click-stops down to f/22. The other is a 1½-in. f/1 telephoto lens for 8-mm cameras with D mounts and B & H mounts for models 124 V and W, 172 A, B, and C. Prices are respectively, $199.50 and $99.95.

EXTREME CLOSE-UP lenses are announced by Spiratone, Inc., 49 W. 27th St., New York. Available in 4, 5, 6, and 10 diopters, close-up work up to 3¼-in. from subject is possible. The 10 diopter lens is unmounted but the other three are mounted in metal rings and all four fit standard filterholders. Prices are, respectively, $3.25, $3.75, $4.25, and $5.25.

FILTERS

NEUTRAL DENSITY filters for fast panchromatic films are announced by Tiffen Marketing Co., 71 Jane St., Roslyn Heights, L. I., N. Y. They are known as Photar X8 and X10 and are available in all standard Series sizes to reduce light intake when photographing in brilliant sunlight. Prices start at $1.65 and a catalog is available.

FILTER INFORMATION chart listing each filter type and its use with color or black-and-white films, and including filter factors and film-speed chart with ASA and Weston ratings, is available without charge from Enteco Inc., 610 Kosciusko St., Brooklyn 21, N. Y.

TIFFEN SF-644 slip-on-type filter is made for the 10-mm Angenieux f/1.8 wide-angle lens. Made from thermobonded optical glass, the mount has two milled surfaces for clearance of other lenses when used on turret cameras. Available in Type A, Skylight, and other colors; price is $7.50. Catalog of filters and accessories from Tiffen Marketing Co., 71 Jane St., Roslyn Heights, Long Island, N. Y.

HI-TRANS screw-in filters feature Colorim (rims matched to filter color) for instant selection of filter. Claimed are thermobonded glass for accurate color control and greater light transmission with fluoride T coating. Front thread accepts screw-in accessories. Available for most cameras, a typical example is $2.95, for the Argus C3 50-mm f/3.5 size. Manufacturer is Tiffen Marketing Co., 71 Jane St., Roslyn Heights, Long Island, N. Y.

FLASH

ULTRABLITZ EXPERT IV electronic flash unit is announced by Allied Impex Corp., 17 W. 17th St., New York 11. Featured are 50-watt-second output; guide numbers of 55 to 65 with daylight Kodachrome and 220 for black-and-white films with 5 "D" cells or 110-volt a-c operation; 1/1500 sec flash duration; 0-delay synchronization; built-in half- or full-power switch; weighs four lb. Price, less batteries, is $69.95.

FR CORP. 251 Brook Ave., New York 51, announces the FR Electronic Flash Model III. Similar in appearance and design to the Model I, it can be operated on a-c in addition to operation with four self-contained D batteries. Weight is 2½ lb and price is $54.95. Owners of Model I units wishing the adaption feature can send their unit and $5 to FR.

LIMELITE CORP., 6040 W. Jefferson Blvd., Los Angeles 16, announces the availability of an a-c adapter for use with the Limelite electronic flash unit. The adapter fits into the battery case of the unit for operation on 110 volts a-c, and can be used for reforming the capacitor that has been stored without batteries for an extended period of time. The sealed unit is guaranteed, furnished with a 15-ft cord, and is priced at $29.95.

GENERAL ELECTRIC flashbulbs are now packaged in sleeves which can be easily split into four- or eight-bulb packs. Size and price per dozen bulbs are: M2, $1.08; #5, $1.44; 5B, #6, $1.80, 6B, $2.28; and SM, $1.68.

ACCURA REFLEX MASTER is a folding flashgun for most twin-lens reflex cameras. The unit features attachment to the viewing hood and need not be removed when hood is closed; acceptance of B-C or Penlite batteries; testlamp pushbutton control; household-type cord connection; bulb ejector; and weighs five oz. Distributed by Photographic Importing & Dist. Corp., 135 Broadway, New York 6, price is $9.95.

ILLINI 300 is an electronic-flash-unit kit. When assembled, it features 300-volt operation providing 100-watt-sec output and 1/600-sec flash duration. Price of $59.50 includes tubes, capacitors, reflector, flash gun, and universal mounting bracket. Power pack AC 2-300 may be used. Occupying same space as B-C unit, it comes in kit form and is priced at $13.50. Manufacturer is Illinois Condenser Co., 1616 N. Throop St., Chicago 22.

SERIES 500 speedlights, designed for portrait-type studios are announced by American Speedlight Corp., 63-01 Metropolitan Ave., Middle Village 79, L. I., N. Y. Light intensity can be cut for black-and-white work. Modeling lights are in ratio to the flash intensity and have the same coverage. Power supply of each unit nests in the base and Koiled Kord cable goes through the center of the stand. Lights available are AA-501, 20-in. unit for main light, $345; AA-502, adjustable-beam spotlight, $369; AA-503, adjustable snoot hairlight, $389; AA-504, small backlight, $235.

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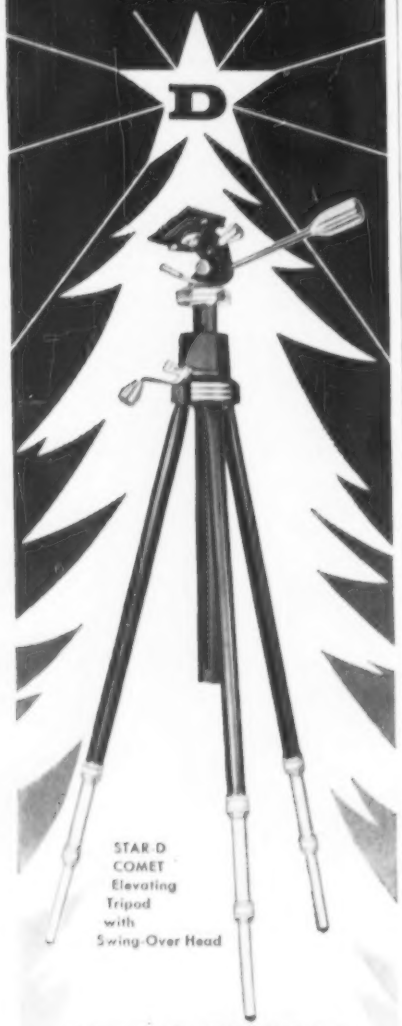

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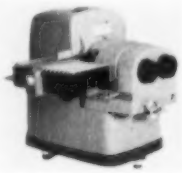
light are announced by American Speedlight Corp., Middle Village 79, Long Island, N. Y. Model AL-417 is designed for operation with 900-volt equipment and has a light output of 1400 ECPS (effective candle power seconds). BL-411, for use with 450-volt equipment, has an output of 500 ECPS. Priced at $45, they have a provision for filters and attach to Series IV adapter rings. For other series rings, a step-up or -down ring is necessary.

PROJECTION & VIEWING EQUIPMENT

SOUNDVIEW PhD is a 500-watt filmstrip and slide projector. Featured is a lever-action film advance; filmstrip preview mechanism; separate switch for fan permitting after-cooling of lamp; air duct blowing air directly on film aperture; and a weight lower than most 300-watt projectors. Price is $89, add $9.90 for case. Manufacturer is Automatic Projector Corp., 282 Seventh Ave., New York 1.



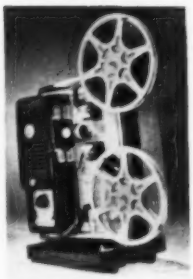
TDC Stereo Vivid DeLuxe is a 750-watt stereo projector. Featured is a manual stereo slide changer; a manual 2x2 slide changer; and a TDC Stereo Selectron with Selectray. No adapters are necessary. Improved cooling system is claimed to make possible the use of two 750-watt lamps. Price, with two 5-in. matched lenses, is $179.50; with two 4-in. lenses, $189.50. TDC div. of Bell & Howell, 7100 McCormick Rd., Chicago 45, also announces the TDC Stereo Vivid has been reduced to $149.50.

FILMOSOUND 385 is the latest addition to the projector line of Bell & Howell Co., 7100 McCormick Rd., Chicago 45. It is claimed to produce four times as much sound volume at low voltage as previous models; provide reserve gain to compensate for variations in film print; assure full sound volume in low-voltage areas. Illumination is supplied by a 1000-watt lamp. Price of the single-case model is $464.95, with a 2-in. Super Provenal f/1.8 lens, lamp, and ac-dc motor. Full details available from B & H.

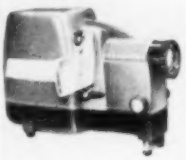
FILMOSTO A is the name of glass binders with masks for the automatic Airequipt slide changer. Unit consists of two sheets of very thin, precleaned optical glass which are joined together with an adhesive after transparency is inserted into a built-in mask. A box of 20 units is priced at $1.95 and a box of 100 is $8.95. Distributor is Karl Heitz, 480 Lexington Ave., New York 17.

AIREQUIPT MFG. CO., INC., 20 Jones St., New Rochelle, N. Y., announces the Airequipt Stereo Theater. It is an automatic viewer which takes a magazine holding 24 slides and advances them automatically during viewing. Slides remain permanently stored and indexed in the magazine. Other features are fingertip focusing; interocular adjustment; even illumination by a-c or batteries. Price is $29.95 less batteries and extra magazines are $1.49 each. Accessories are a lift-off carrying case, $10.95, and an a-c power cartridge with an eight-ft cord, $4.95.

MARK II SHUTTER Conversion Kits for all Victor 16-mm projectors produced after 1942 are announced by Victor Animatograph Corp., Davenport, Iowa. An increase of light by 38% is claimed over the previous three interruption shutters. Installed at Victor Service Centers, price is $21.50.



CINE-KODAK SHOWTIME is an 8-mm movie projector announced by Eastman Kodak Co., Rochester 4, N. Y. Through the use of a new shutter, 60 percent more light is claimed to be transmitted, filling screens up to five feet wide. Also featured are reverse action for review of scenes, lumenized f/1.6 lens, and single-frame projection. Price is $115 incl. tax.



TCD HEADLINER, a 2x2 projector, is announced in an economy model by TDC div. of Bell & Howell Co., 7100 McCormick Rd., Chicago 45. It features a five-in. helical focusing anastigmat lens; blower cooling; manual changer; and a 200-watt lamp, although it can accommodate a Selectron-Semimatic changer and a 300-watt lamp. Price is $39.95 and case is available at $6.

REMOTE CONTROL UNIT which slips onto the Airequipt Automatic slide changer or which can be connected to any recorder having tape-film synchronization is announced by Airequipt Mfg. Co., Inc., 20 Jones St., New Rochelle, N. Y. Price is $29.95.

BI-LENS 35 is a 2x2 transparency viewer employing a twin-lens binocular principle, giving 5x magnification and full frame coverage. A strong dimensional effect is claimed, similar to that of stereo slides. Lenses are of ground glass. Manufactured by Sawyer's Inc., Portland, Ore., the price is $4.95.

ARGUS PRE-VIEWER for 35-mm transparencies is announced by Argus Cameras, Inc., Ann Arbor, Mich. A TV-type viewing lens is claimed to permit viewing by two or more persons at the same time. Slide is inserted through top and illumination is supplied by batteries. Price is $7.95.

TOWERPAN-RAM hand slide viewer produces 4x magnification of 35-mm and 828 transparencies. The optical system presents a reflected image rather than a direct view through the transparency, for a claimed 3-D effect. Both eyes are used in viewing and viewing hood accommodates eyeglasses. A product of Sears, Roebuck and Co., 925 S. Homan Ave., Chicago 7, price is $9.95; battery-illuminated model, $12.95.

REEL-TAINER is a movie reel which features automatic threading. When film end is dropped into the reel the sprocket holes are caught by a series of nibs. Clutch arrangement in the core is claimed to keep the film tightly wound without danger of tearing, scratching, or bending film. Flip-on ring makes reel its own container. Sizes

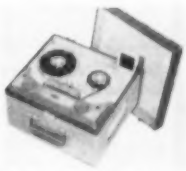
and prices are: 8-mm 200 ft, 99 cents, and 8- or 16-mm 400 ft capacity, $1.20. Manufacturer is Apt Corp., 4332 Stockton Blvd., Sacramento 20, Calif.

BLUE TOP projection lamp features a jewel-hard ceramic finish bonded to the lamp top and is claimed not to chip, scratch, peel, or flake. Sylvania Electric Prods., Inc., 1740 Broadway, New York 19, claims this finish concentrates maximum light opposite the lens, creating a brighter image on the screen. A 300-watt lamp is priced at $2.50, the 500-watt, $4.15.

SOUND PROJECTION EQUIPMENT

DeJUR-AMSCO CORP., 45-01 Northern Blvd., Long Island City 1, N. Y. announces two tape recorders, TK-820 (illus.) and TM-819A for custom installation. Featured are dual-track operation push-button track reversal; piano-type key switchboard; for separate erase and record-playback heads; level indicator for recording and a frequency-compensated loudness control for playback; special input selector switch allows three signal sources to remain permanently connected; dynamic cardioid microphone with matching line transformer. Prices are, respectively, $379.50 and $299.50, and additional information is available.

CRESTWOOD CONCERTO Model 360 is introduced by Daystrom Electric Corp., Poughkeepsie, N. Y. Some features are push-button control, printed-circuit preamplifier; 10-watt power amplifier; woofer and tweeter speaker system; storage space for microphone, cords, and four seven-in. reels of tape. Price is $299.50 in wooden cabinet; legs optional at $10.



MODEL 556 is a tape recorder featuring dual-track recording at 3¾ ips; fast forward and rewind; full-hour recording on a single five-in. reel; recording-level indicator; and easy threading. Price, incl. crystal-type microphone and stand, connecting cord for radio or phonograph, five-in. reel, with tape, pick-up reel, and a-c line cord, is $79.95. Manufacturer is Telectrosonic Corp., 35-18 37th St., Long Island City 1, N. Y.

LA BELLE AVT Sound Slide combination is announced by La Belle Sales Corp., Oconomowoc, Wisc. A Control-Recorder has two heads, one for recording and one for playback. While recording, a cue-button is pressed when a slide is to be changed, placing a 1,000-cycle note on the commentary tape. During playback, with recorder connected to projector, the note is converted to electrical energy, eliminating manual slide changing. Recorder also features dual speeds, automatic erase, record level indicator, separate jacks for radio, mike, tuner, and external speak-

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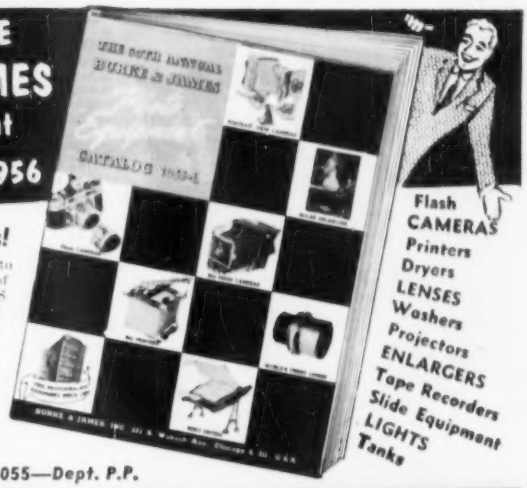

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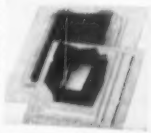

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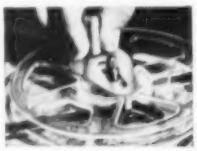
er, 5x7-in. oval FM type speaker, and manual and foot controls. The Professional 75 projector features remote control, 500-watt lamp, 5-in. f/3.5 lens, turbine cooling, prewarming slide chamber, knob focusing, anti-jamming head, and a 5-in. magazine holding up to 150 slides in sequence for automatic projection. Price, complete with matching cases, $449.95, or $295 and $154.95, respectively.

THREAD TAPE is a reel for magnetic tape. By splicing a leader to the tape, it is claimed to thread automatically, eliminate wow caused by edges rubbing, and preserve magnetization of tape. Any part of the tape may be marked on the label, then run fast to the place and played. DeLuxe 7-in. reel includes dust-proof container, extra labels, leader and splicing cement and is priced at $1.40; 5-in. reel without container, 75 cents. Manufacturer is Apt Corp., 4332 Stockton Blvd., Sacramento 20, Calif.

IRISH DOUBLE-PLAY TAPE #7-2400 is announced by ORRadio Ind., Inc., Shamrock Circle, Opelika, Ala. With 2400 ft of magnetic tape available on a seven-inch reel, double the playing time is available at all speeds, it is claimed. At 1⅞ ips, up to four hours of single track and eight hours of double track may be recorded. Price is $7.50.



METAL THREADER for threading tape on a blank reel holds tape to the reel for the first few turns to get the winding started. It can then be slipped off or left on as a reel crank. Fitting reels up to seven in., price is 98 cents. More information from The Flahan Co., 7517 Pelham Dr., Cleveland 29, Ohio.

DARKROOM EQUIPMENT

MULTI-PRINTER is designed to make multiple contact prints with 35-mm cut lengths or filmstrip. Film is threaded in film holder by perforated edges and remains in a bowed position until paper is inserted and frame closed, claimed to eliminate scratching and shifting of films. Professional Model A, for six lengths of six frame strips on 8x10 contact paper is priced at $7.95; Amateur Model B takes lengths of strip film and produces one six-frame strip, is priced at $2.95. More information from MP Mfg. Co., Box 79, Brooklyn 23, N. Y.

GRADUATED POLYETHYLENE CYLINDERS for darkroom use are a product of The American Agile Corp., P. O. Box 168, Bedford, Ohio. They are claimed to have excellent chemical resistance to most acids, alkalis, and other solutions at temperatures up to 175 degrees F, and to be stain- and leakproof. Standard sizes range from 25- to 1000-ml capacity, prices from $3.30 to $8.50.

AUTOMEGA E-5 Autofocus enlarger handles negative sizes from 2¼x2¼ to 5x7. Automatic focusing controls permit shifting from one print size to another without shifting focus. The E-5 accepts interchangeable lenses from 3½ to 7½ in. in focal length; is reversible for floor projection; may be equipped with condensers for negatives up to 4x5 and with the fluorescent Omegalite, up to 5x7. Double condensers are interchangeable and matched to focal length of lenses. Magnification is controlled by a rack-and-pinion hand crank. Price of the Standard Omegalite model, not including matched lens, lens mount, and tracks, is $265; D-type condenser lamphouse with Col-

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MILWAUKEE, WIS.

orhead and set of 6½-in. tracks is $61.80. Manufacturer is Simmon Bros., Inc., 30-28 Starr Ave., Long Island City 1, N. Y.

BFI 7-MINUTE DEVELOPING PROCESS is accomplished with special BFI chemicals and a tank containing seven separate, removable pint cups and a light-proof revolving lid. Cups are filled with developer, shortstop bath, fixer, water rinse, hypo neutralizer, water wash, and wetting agent. Film is darkroom-loaded onto reel; pushed into lid turret, and placed on the processer. Turret is turned to starting index. Loaded reel is pushed into the developer, agitated, and moved along into each tank until processing is complete. The unit is adaptable for print or color processing. Water-jacket tank may be filled with water of proper temperature and has a hose-inlet-outlet arrangement. Priced at $23.75, necessary solutions are included. Manufacturer is Brown Forman Ind., 1908 Howard St., Louisville 1, Ky.

SEMI-PRO is announced by FR Corp., 951 Brook Ave., New York 51, as the most complete beginners' home-developing and contact-printing kit. It includes an adjustable FR developing tank, three "printrays," film clips, thermometer, chemicals, printing paper, darkroom bulb, all-metal contact printer, and instruction book. Price is $12.50.

FILM AND PAPER

KODACHROME TYPE F film for photoflash use without a filter and with clear, wire-filled lamps is announced by Eastman Kodak Co., Rochester 4, N. Y. For daylight use, a Wratten No. 85C filter is needed and exposure is the same as with Kodachrome Daylight Type. With photoflood illumination, a Wratten 82a filter is needed and exposure index is 10. With 3200 K lamps, a Wratten 82C filter is used with exposure index of 8. Film price is now $1.85 (20 exp.) and $2.60 (36 exp.) 35-mm cartridges, and $1 for 828 (8 exp.). Kodak also announces discontinuance of processing charge included in film price. Processing charge by Kodak or independent laboratories start at $1.50 for 20 exp. cartridge.

WARMTONE ARTWEAVE (ZL), a Du Pont photographic paper, is now being produced on a white stock, replacing the earlier cream-tinted surface. Velour Black surface QL has also been discontinued but remains available in the Warmtone surface QL. Announcement is from E. I. du Pont De Nemours & Co., Wilmington, Del.

MINOX DAYLIGHT COLOR film with an exposure index of 32 is announced by Kling Photo Corp., 235 Fourth Ave., New York 3. Film can be processed commercially or with Anscochrome processing kits. A 36-exp. cassette for the Minox camera is priced at $1.95.

POLAROID PROFESSIONAL Pan Land Film for Speedliner and Pathfinder cameras is announced by Polaroid Corp., Cambridge 39, Mass. Speed is 200 (ASA equivalent) and contrast can be controlled by reducing or extending normal developing time of 45 sec. Dynamic range is 60-100 and it is claimed there is no evidence of grain when prints are examined under a 400-power microscope. An eight-exposure roll is priced at $2.95.

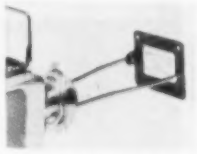
SUPER-XX roll-film and film packs have been discontinued, announces Eastman Kodak Co., Rochester, N. Y. Plus-X has been improved and now has an exposure index of 80 for daylight and 64 for tungsten light.

KODAK COLOR-PRINT MATERIAL is announced by Eastman Kodak Co., Rochester 4, N. Y. Type C is designed for printing from Ektacolor and Kodacolor negatives, while Type R is designed for printing with a single exposure from Kodachrome or Ektachrome transparencies. Prices for both papers start at $10.15 for a package of 25 sheets 8x10 in size. Color Conversion Kit Type C (reading and printing filters, standard reference lamp, photocell, and timers) is available as an accessory with Type C paper.

ANSCOCHROME 16-mm daylight-type movie film is announced by Ansco News Bureau, Binghamton, N. Y. The exposure index is 32, permitting picture-taking in dimmer light than previously possible. It is claimed to have color-curve uniformity (pictures get uniformly darker or lighter as exposure is decreased or increased). Prices are $6.95 for a 50-ft magazine and $10.40 for a 100-ft spool, including processing.

MISCELLANEOUS

QUICK-SNAP coupler (page 130, Sept. 1955 issue) is manufactured by Hansen-Lonnes Co., 853 West Hoyt Ave., St. Paul 3, Minn. Address appeared erroneously as East Hoyt Ave.



POCKET TITLER for 8-mm movie cameras attaches to camera lens for on-the-spot titles, eliminating photographing and splicing titles later on. Fades, wipes, and revolving titles are possible. Price $9.95, includes title cards and close-up lens. Three models are available; B, for Brownie 2.7 and 1.9 cameras; K for Series 4 Kodak adapter ring; and C for Tiffen C adapter ring. Manufacturer is Mansfield Ind., Inc., 1227 W. Loyola St., Chicago 26.

EMDE 2x2 aluminum-foil masks with ultra-thin glass is used for mounting transparencies in Airequipt magazine frames. Film is inserted under mask nibs, slipped between the glass, and inserted into the frame. Price of a 100-unit box is $7.50. More information from EMDE Products, 2028 Stoner Ave., Los Angeles 25, Calif.

PERSONALIZED CUSTOM color processing service is announced by Kurshan & Lang Color Service, Dept. A, 10 E. 46th St., New York 17. Each roll or sheet film of Anscochrome and E-2 Ektachrome is individually processed in Nikor reels and hangers and automatic agitation machinery is used. Charges are $1.50 for 20-exp. and $2.25 for 36-exp. cartridges, mounted; $1.25 for 120 and 620 roll films (8 exp.) and $1.50 for 12 exp. in matte sleeves. Price card, brochure of services including color prints, and mailing bags free upon request.—

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LEICA-METER 2 fits into accessory shoe of Leica, into retainer plate on chain, or can be carried separately.

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candid shots by the Editors

All About Bottled Lightning

Flash photography now has a quarter-century of "past"; its present is bright, and its future is dazzling. Far from being sidetracked by the introduction of new fast films and phenomenal developers, it has grown steadily in versatility and usefulness, especially in very recent years. We decided it was time for a comprehensive magazine treatment of all aspects of flash: simple and complex, for color and black-and-white, direct and indirect, bulb and speedlight. This issue is the result of many months of planning, writing, and shooting by our staff and a corps of outside experts. Here are a dozen features on flash photography that you will find of great interest and lasting value. Help yourself!

Meter-Reading with a Camera

If you're not at home when the man comes to read your gas and electric meters, you'll get an estimated bill on the first of the month. If you have ever found this annoying, you'll be interested in a story passed on to us by our friends at the Polaroid Corporation. It's from *Contact*, a trade publication of the New England Electric System. The utilities company has a customer in Winthrop, Mass., who is never home when the meter reader comes calling. Estimated bills had been routine for a long time until one day when the company employee found an envelope at the door marked "Meter Reader." The customer owned a Polaroid Land Camera and had snapped a 60-second picture of his meter before going to work that day, and left it for the reader. Says *Contact*, "Each dial showed very clearly, and the reading was obtained easily from the picture."

When Rivals Meet . . .

The designer of the Rolleiflex, E. R. Heidecke of Braunschweig, Germany, vacationed a few months ago in Sweden. Quite naturally, he looked up an old friend in Göteborg who is also in the camera business: Victor Hasselblad, designer of the camera that bears his name. The host took Herr Heidecke on a tour of his factory, and then the two went to Hasselblad's summer place at Raö (approximate pronunciation: "ro-euh"). There, according to our informant, "after having discussed photo problems of common interest, the two gentlemen started a photo competition under nice and cozy forms, using cameras of their own make with the fellow-competitor as subject. The result was a series of unconventional and immediate pictures." We weren't privileged to see any of the nice and cozy forms, nor any of the immediate pictures, but we do have a good shot of the fellow-competitors with cameras of their own make.

Hasselblad (left) and Heidecke.

Coming next month . . .

A SPECIAL ISSUE

15 experts answer photography's biggest question:

"WHAT MAKES A GOOD PICTURE?"

And you'll learn about

- **The 5 tools of composition**
- **Camera angle, and the difference it can make**
- **The quality of light**
- **Action, and the impact it lends**
- **Offbeat color—how and when to use it**
- **The importance of printing**
- **How to crop creatively**

PLUS a gallery of wonderful pictures, 8 pages of them in full color. Don't miss the fascinating *February* issue!

Morris Gordon on New Color

With the advent of the new high-speed color films, E-2 Ektachrome and Anscochrome, early last year, so much attention was paid to their inherent high speed and their "pushability" to even higher speeds (by processing manipulations) that their response to various types of flash illumination was largely overlooked. We felt we could do the best job of filling this gap by asking a professional photographer who is often required to use flash in his daily assignments to share with us his first test results on the new color materials. We selected Morris Gordon, chief photographer of the Western Electric Company's house publication *WE*, to do the job. Gordon was a newspaper and syndicate photographer for many years before joining Western Electric, and his color shots frequently appear in leading "slick" magazines even today, for his job setup permits him to do a certain amount of free-lance work, and his services have been in constant demand. The test assignment, outlined in the article starting on page 60, was necessarily limited to the three new color materials available at the time the tests were begun: Daylight Type Anscochrome (the artificial-light type had just been announced and was not on the market), and E-2 Kodak Ektachrome in both Daylight and Type F, the latter balanced for use with clear flashbulbs.—▶

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if you are determined to give the best: a camera that will do everything expected of it—and more. Leica is camera craftsmanship at its finest: superior optics, ingenious design, ultra-precise engineering. A Leica's superiority is further distinguished by its ease of operation, proven reliability, and rugged endurance.

a. Leica M-3

The ultimate in camera design. All the Leica features of versatility, plus:

- Combined rangefinder-viewfinder with unique bright-line frame for interchangeable lenses
- Precision quick-change lens mount
- Lever for rapid film advance
- Shutter-coupled light meter
- Automatic-setting exposure counter
- Complete flash synchronization
- Shutter speeds from 1 to 1/1000 second and bulb

b. Leica III f

The aristocrat of the 35mm field. Completely versatile, rugged and precise. Among its features:

- Interchangeable lenses
- Built-in coupled rangefinder
- Complete flash synchronization
- Shutter speeds from 1 to 1/1000 second, time and bulb
- Exposure counter
- Delayed-action shutter release

c. Leica II f

A remarkably low-priced Leica. The IIf is identical with the IIIf except for the extra-slow shutter speeds and the delayed-action timer. Designed for ease and simplicity of operation. Among its features:

- Built-in rangefinder
- Shutter speeds from 1 to 1/1000 second, time and bulb
- Complete flash synchronization

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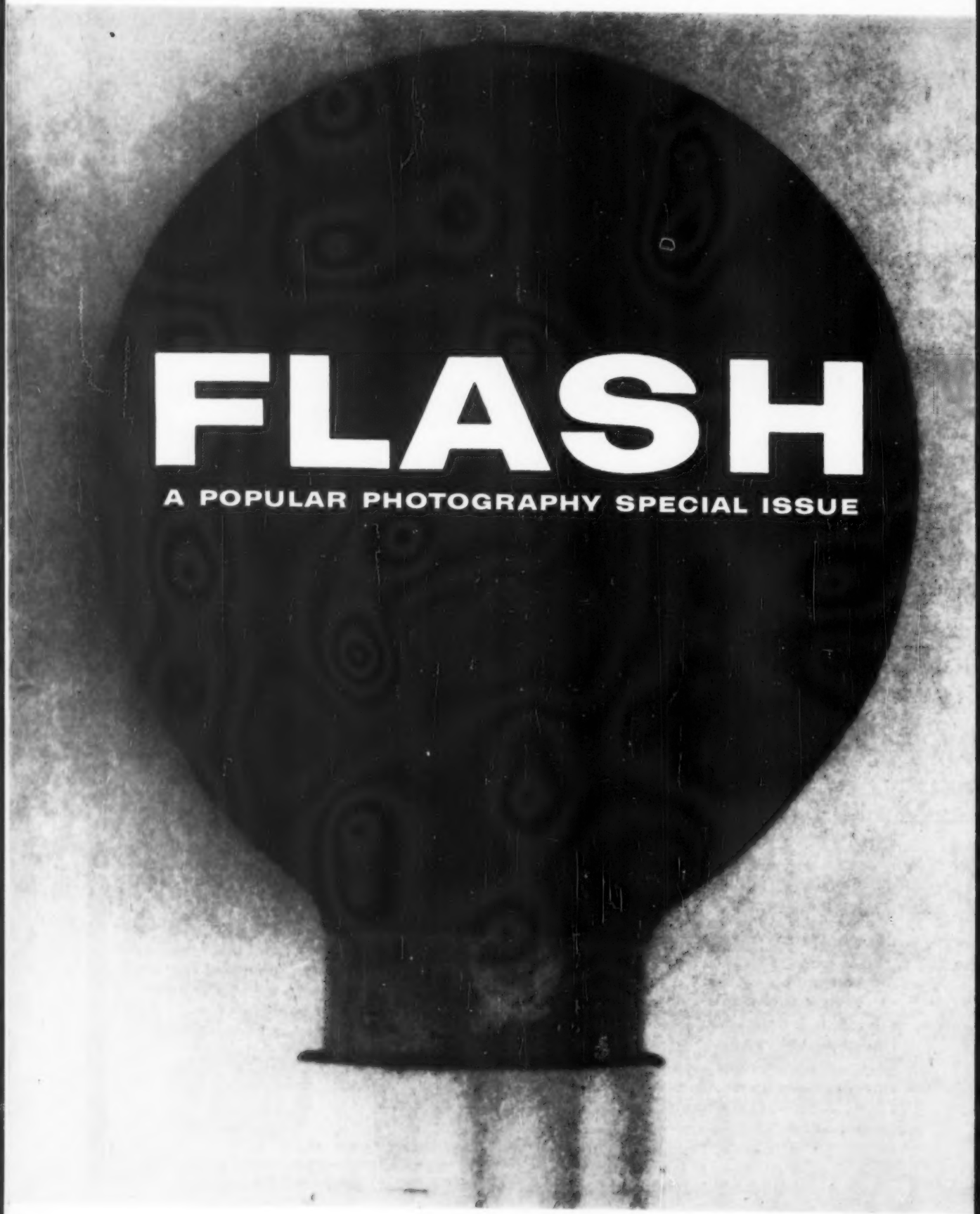


FLASH

A POPULAR PHOTOGRAPHY SPECIAL ISSUE

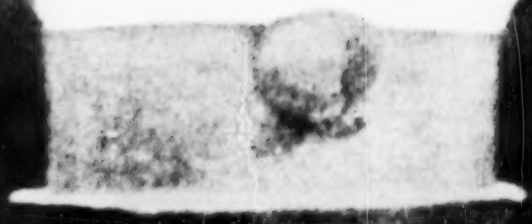
FLASHBULBS OR

Flash photography today is no longer a novelty. In twenty-five years it has grown from a tool used almost exclusively by press photographers to one used by fifteen or twenty million snap-shooters. Today everybody is a flash photographer, and practically every camera on the market is equipped with internal flash synchronization.

In recent years electronic flash, or speedlight, has entered the picture, and today most cameras above the box class are equipped with connectors for "X" synchronization, which means that they can be used with speedlights as well as flashbulbs. This poses a nice question for the photographer about to embark in flash photography: What shall he buy—a flashgun for flashbulbs or a speedlight outfit which will enable him to make flash pictures without the bother of changing bulbs—or both? This is not an easy decision to make, but this special issue of POPULAR PHOTOGRAPHY should at least clear up a lot of confusion.

For many people, the relatively high initial cost of the speedlight provides an immediate answer. The lowest-priced outfits run around $30 compared to $10 for a flashgun. But there are many other factors—some of them hidden—which should be taken into consideration before making an intelligent choice. The higher initial cost of the speedlight outfit, for instance, may not be too high if the photographer intends to shoot plenty of flash pictures, since every shot saves a flashbulb. Relative weight and portability of the equipment, light output, and special requirements of the individual photographer are a few of the many factors that should also be considered. All of them are covered thoroughly by Bob Schwalberg in the special speedlight section in this issue.

But whether you own, or contemplate buying, a speedlight or flashgun, this exciting special issue should be of immense help. From beginning to end it is packed with revealing facts, dramatic pictures, inspiration, and solid know-how on photography with flash.—



SPEEDLIGHTS?

What you should know about

flash equipment

By **HARVEY SHAMAN** Photographs by the author

AT ONE time or another, you have inserted a bulb into your flashgun and pushed the button, only to have something go wrong. Practically every photographer has had this embarrassing experience, so don't think you are unique.

There is a saying, "Knowledge is power," and when it comes to flash, it certainly holds true. A basic understanding of how the equipment works and some of the bugs it can develop will go a long way toward making flash a pleasure instead of a pain.

Like everything else in photography, flash is based on a step-by-step logic, so we'll proceed along those lines. Let's take a look at the various types of equipment and how they work, the types of flashbulbs, troubles you can run into with flash equipment, and the remedies for them. Finally, we shall discuss a few simple safety steps which can help prevent much of your trouble before it can get started.

Let's start with types of equipment and how they work.

Flashbulbs are fired in three basic ways:

1 By ordinary dry-cell batteries hooked in series very much like an ordinary flashlight: As long as the switch of the gun is closed, current flows through the circuit between the flashgun, the flashbulb, and the camera.

2 By B-C or Battery-Capacitor unit, which is a dry-cell battery wired to a condenser: The condenser drains electricity from the battery until it is fully charged. When the gun is fired, the condenser suddenly releases its charge, letting a very heavy surge of electrical current go to the flashbulb. This method might be compared to a dam which stores up the water of a small stream. When the spillgates of the dam are opened, the water flows out very swiftly and with a tremendous amount of energy.

3 By standard electric current such as is found in every house and building: Bulbs fired in this way are screwed directly into household lighting fixtures. (See the December 1955 issue of POPULAR PHOTOGRAPHY, *What You Should Know About Electricity*, giving manufacturers' recommendations for using flashbulbs in this way.)

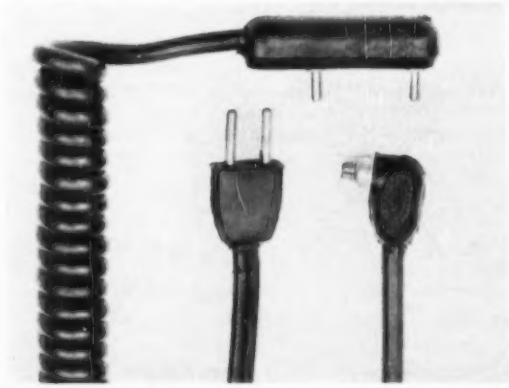
Synchronization is achieved in four ways. (This refers to the timing of the flashbulb and shutter so the bulb is burning at its brightest as the shutter reaches its widest opening.)

Internal—This is done by electrical contacts built into the shutter itself. When the shut- (*Continued on page* 144)

Batteries

Four types of batteries power most flash units. They are (back, left to right) the "D" 16-amp cell; "C" 7-amp cell; "AA" 5-amp penlight cell, and (foreground) a 22½-volt B-C unit.

Connectors



Connectors and cord types vary with type of camera and flashgun. Shown are (top) coiled extension cord for use with Exakta, (center) solenoid cord, and Compur-type cord.

FLASH OUTFITS

Elementary—*for simple on-camera flash pictures*
Price range: $3 to $8
Includes:

- Flashgun which accepts M-2 bulbs
- Reflector
  Synchronization cord or direct shoe fitting on gun base

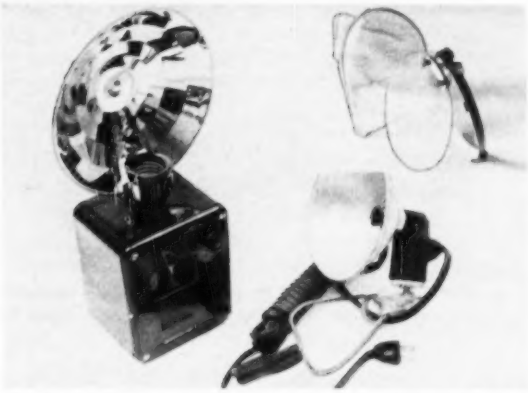
Intermediate—*for bounce, off-camera, and two-light setups*
Price range: $19 to $39
Includes:

- Flashgun (with adapters) which accepts M-2 bayonet-base or medium screw-base bulbs
- Reflector
- Synchronization cord
- Extension outlet
- Extension flash unit

Advanced—*for maximum versatility and multiple flash setups*
Price range: $53 to $76
Includes:

- Flashgun (like Busch B-6, Heiland KB, or Graflite Flash Synchronizers) which has multiple outlets for extensions, solenoid and remote control outlets, provision for multiple battery connections
- Flash reflector
- Synchronization cords
- Three flash extension units
- Flash stands or clamps

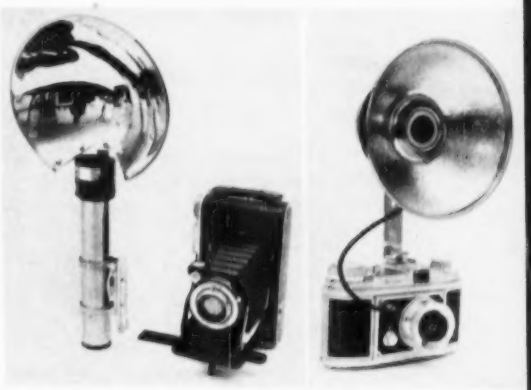
Accessories



Accessory equipment available for flashguns is (inset) plastic bag, a plastic shield to cover gun for safety purposes, (left) slave extension, and plug-in extension with a clamp.

Types of mounting

Flashguns on simple cameras are often connected directly to camera body. Gun is synchronized to fire when shutter is wide open



Bracket (left) can be used to fasten gun to almost any camera with tripod socket. Right, many cameras have shoe which holds flash.

Quick-release bracket is used on many press-type cameras so that flashgun can be easily removed for making off-the-camera flash pictures.

Types of synchronization

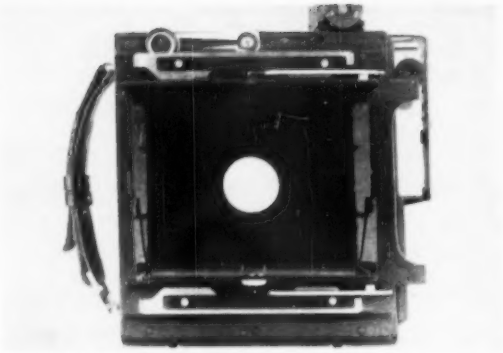
Mechanical: Used on unsynchronized cameras where it is impractical to use solenoid. Timing is set on flash head.

Solenoid: An electromagnet device which is mounted so it will trip shutter release when electrical power flows from flashgun.

Internal: Contact points on leaves of shutter fire bulb when wide open. Such synchronization is built into the camera.

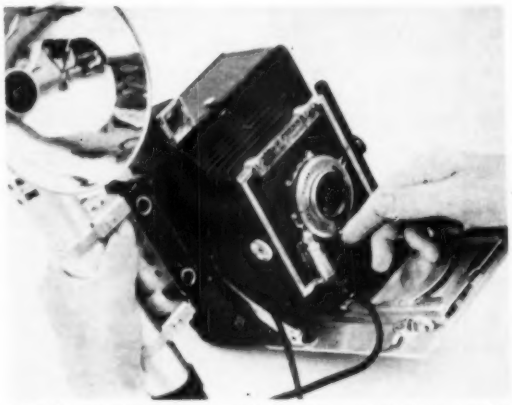
Field test for

Fire bulb against wall, watch light through groundglass.

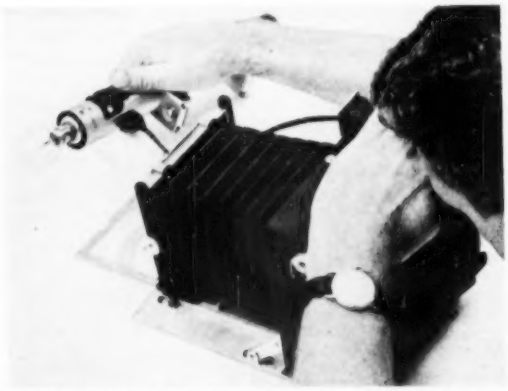


Perfect synchronization

Darkroom

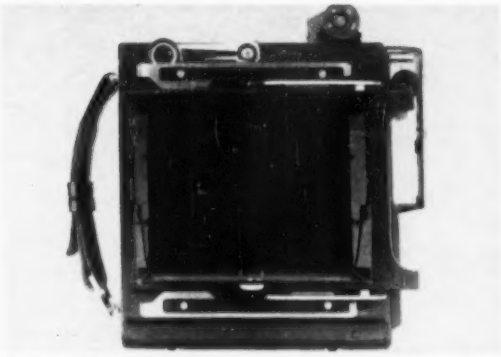


First, set shutter at speed that you most often use in making flash pictures. Diaphragm should be wide open.

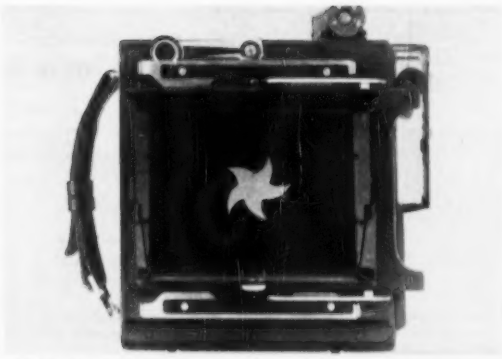


Fourth, without moving out of focus, hold bulb before the lens. Cover your eyes to protect them from light.

synchronization



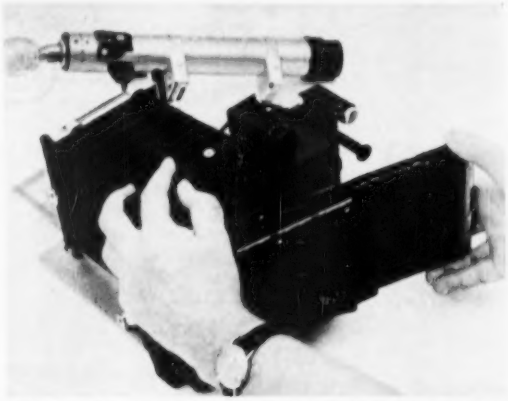
No synchronization



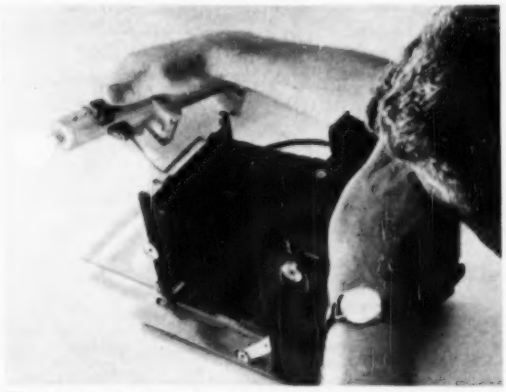
Partial synchronization

synchronization test

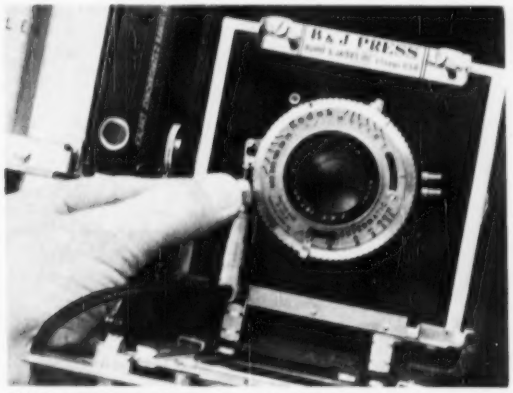
Second, after removing reflector, get bulb as close to camera as possible and focus on it through groundglass.



Third, without moving camera, insert holder, which has been loaded with sheet of single-weight enlarging paper.



Fifth, fire bulb. After developing paper in standard print developer compare results with pictures below.

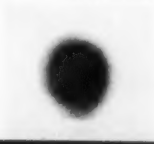


After completing test, solenoid screw is turned up, making shutter fire later, or down, making it fire early.

Full synchronization

Late firing

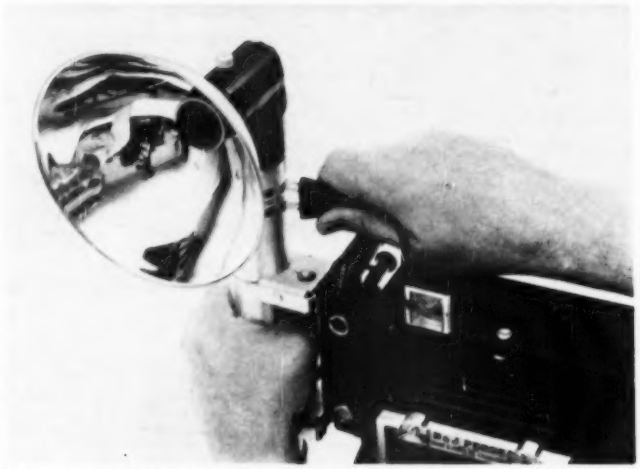
Early firing



All equipment shown courtesy Peerless Camera Stores, New York

Four checks before using flash

Each battery should be checked with an ammeter before a shooting session. Ammeters can be bought at photographic or electrical stores.



Wire connections at the gun and at the camera should be checked. If points fit loosely, bend them together or apart for good contact.

Base of bulb is cleaned by rubbing against sand paper which has been cemented to bottom of gun. Oxide coating on base can cause trouble.

Hold flashgun down, away from face when loading new bulb. If bulb should accidently go off or explode, it will not burn face or blind you.

Safety Guide

1—Be sure the flashgun circuit is open when you put the bulb in. If it isn't, the bulb will go off as you insert it, with the possibility of burning your hand and temporarily blinding you. If you are unfamiliar with the equipment, or the equipment is cold or had rough handling, be sure the cord is disconnected when you put in the bulb. Have the gun aimed away from you when you connect the cord.

2—Check the bulb for cracks. A crack will let in air, which may cause it to explode. Some manufacturers put a spot of blue color on the top of their bulbs. If this spot has turned pink, it means the bulb is bad and should not be used.

3—Never take flash shots of people from closer than five feet or fire the equipment in an explosive atmosphere, because of the danger of the bulb exploding when it is fired. Although slightly inconvenient, it is wise to use a clear plastic shield over the front of the reflector when taking flash shots of people.

4—Never pull used bulbs out by hand. Use the ejector. You can be burned by the hot bulb or it may break off its base. Removal by pulling out with your hand can also damage the socket of the gun.

5—Never drop freshly fired bulbs into a bag or pocket containing new bulbs. The heat may ignite them.

6—Never give used bulbs to a child. The burned filaments create an oxide which may be poisonous.

7—Never fire flashbulbs by house current unless the manufacturer has specified that they are safe for this method. Such information will be printed on the carton. It will usually say, "Do not use with house current," or, "Safe for 3- to 135-volt operation."

8—When firing flashbulbs by house current, be sure the fixture is turned off before the bulb is inserted, otherwise it will go off in your hand.

Trouble-shooting Chart

Problem:

1—The equipment fails to work or works erratically:

Causes:

- Weak or dead batteries.
- Plugs and contacts corroded or not firmly connected.
- Broken or shorted wires.
- Plugs in backward on equipment having positive and negative markings.
- Shutter contacts worn or corroded.

Problem:

2—Equipment out of synchronization:

Causes:

- Weak batteries or B-C unit not fully charged.
- Incorrect bulb. Example—fast-peak bulb used with a shutter set to synchronize with a medium-peak bulb or vice versa.
- Solenoid out of adjustment.

Problem:

3—Solenoid fires but bulb does not:

Causes:

- Corrosion on base of bulb.
- Bulb not firmly seated in socket.
- Bad bulb.

Problem:

4—Bulb fires but solenoid does not:

Causes:

- Weak batteries.
- Plugs corroded or not firmly connected.
- Broken or shorted wires.

Problem:

5—Extensions fail to work:

Causes:

- Weak batteries.
- Wires too long or have too much resistance.

Boost your available light with

bounce flash

By BOB SCHWALBERG

THERE is a growing awareness today that total reliance upon available-light techniques, regardless of subject matter or lighting quality, is a self-defeating photographic philosophy. This does not mean anything like an anti-available-light trend—far from it. The fact is simply that even the most rabid available-light photographers have learned that a judicious use of flash or speedlight can often help them make better pictures.

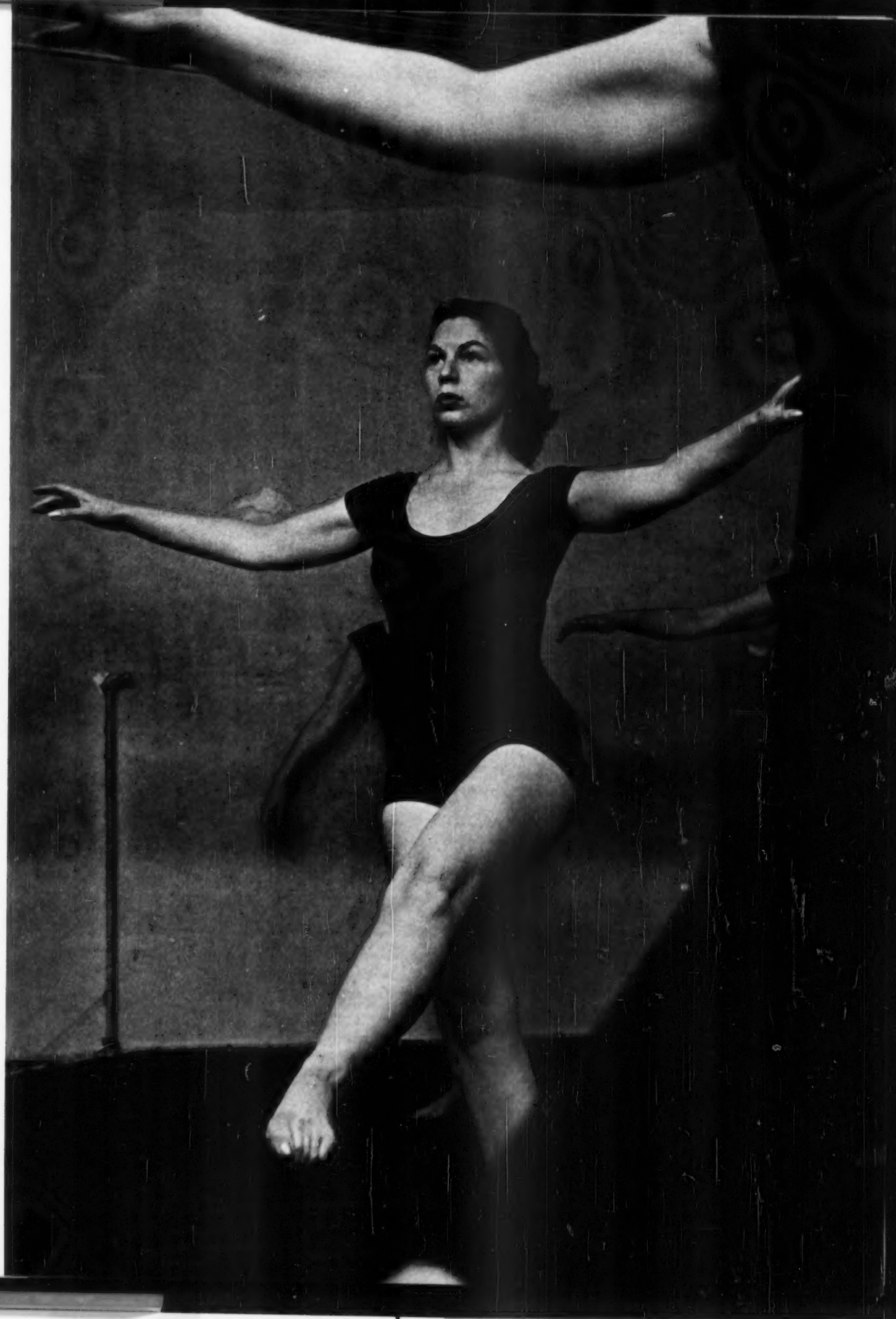
By integrating their flash or speedlight units with their available-light techniques they are able to reap two principal rewards without losing the natural quality of existing indoor illumination. The first is, very obviously, shorter exposures and/or smaller diaphragm stops. This means greater action-stopping ability and deeper depth of field. The second advantage is the ability of flash or speedlight frequently to improve upon existing-light quality either by emphasizing or eliminating various lighting effects.

This "cheating," or maybe we should call it "semi-available-light photography," recalls a rather less than famous anecdote about *PIX* photographer George Karger. (*Continued on page* 104)

→

Weak bounce speedlight permitted Schwalberg to stop action with exposure of 1/50 sec at *f*/4, without destroying available light.

Flash reflector was aimed at intersection of wall and ceiling to fill in shadows with diffuse, low-intensity illumination; *f*/2.8, 1/100 sec.



What you can do with a

simple flash

MOST simple cameras do well enough at recording various festive occasions in the home, but even the most casual amateur soon tires of the flat, uninteresting lighting provided by on-the-camera flash. Addition of a sidelight, a backlight, or both, will give roundness and depth to your subject, texture to the skin tones, and lighten those dark backgrounds. Even hand-held off-camera flash will improve your picture by adding a few shadows to the face and thereby providing modeling of facial features and a more natural and more flattering light.

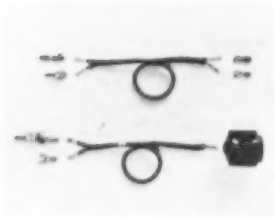
With just a little mechanical aptitude, an hour or two of time, and a dollar's worth of materials, you can very easily adapt your simple on-the-camera flash camera into a multiple-flash outfit that can handle almost any photographic assignment, including portraiture, large groups, and even bounce-flash work.

To adapt your inexpensive camera for multiple flash, you need to make only two separate connections—one from the camera to the flash unit, for hand-held off-camera flash, and the other connection from the flash unit to the extension flash, with which you can use as many as four flashes at one time.

Basically, there are two types of flash connections on simple cameras: either the flash unit is plugged directly into the camera, or a (*Continued on page* 150)

Clear flash on camera is commonest indoor picture-taking method. Small photo at left shows how camera was held for the portrait above. Note comparative flatness of light, and strong shadows on background.

Here's how easy it is to make and



All you need to make extension (top) and multiple-flash cords can be bought for a dollar: banana plug, RCA phono plug, alligator clamp, terminals, tap.

Pin contacts taken from a wafer radio-tube socket are a perfect fit for the prongs of simple flashguns. Solder them to the ends of off-camera extension wire.

Connection is just a matter of slipping the contacts onto flashgun prongs. Other end of wire has one RCA phono plug, one banana plug to fit into camera.

Extension connector requires no soldering. Alligator clamp has setscrew, spade tip has pinch-on feature. Clamp goes on bulb ejector, the lug on body screw.

camera

By CARL LINDQUIST
Photographs by the author

Diffused flash, with inexpensive plastic cover over reflector, gives less-harsh lighting effect. The cover also serves as protection if a bulb breaks; some have a blue side for using daylight color film indoors.

attach extensions

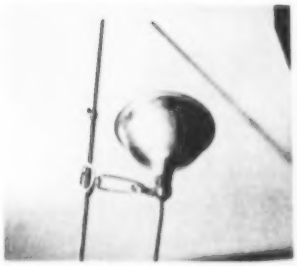
Complete outfit, ready for operation. Total cost for wire and hardware: a little over a dollar. Three-way tap on extension cord permits use of four bulbs at once. Also shown are B-C flashpack and close-up attachment.

Off-camera flash provides more interesting lighting and eliminates unwanted background shadow. This simple extension is the one you can make as described on these pages. It can be held at either side, high or low.

Bounce flash, aimed at wall, ceiling, or window shade, comes closest to resembling available room light. It can be used with cameras having apertures as wide as f/8, or with more-powerful bulbs, like No. 22.

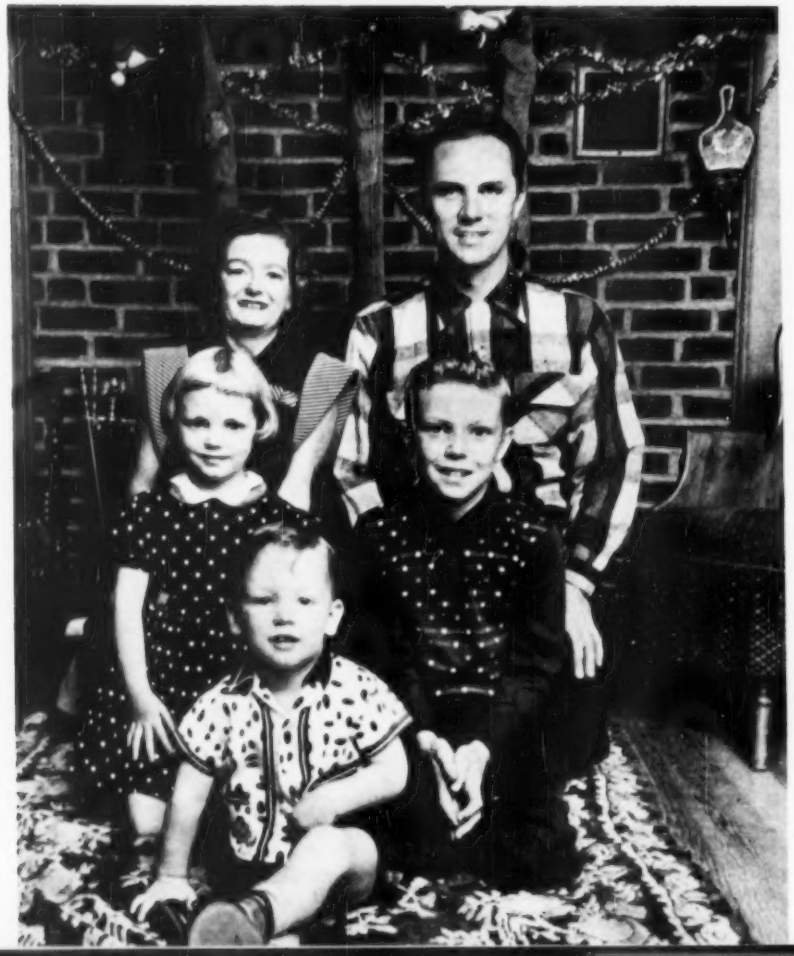
SIDE-LIGHTING

Direct off-camera flash, at 90 degrees from the camera, is a dramatic light source for portraits. The extension is plugged into the flashgun, which remains on the camera, but there is no bulb in the gun itself. With an SM bulb in reflector, the exposure was "instantaneous," f/16.



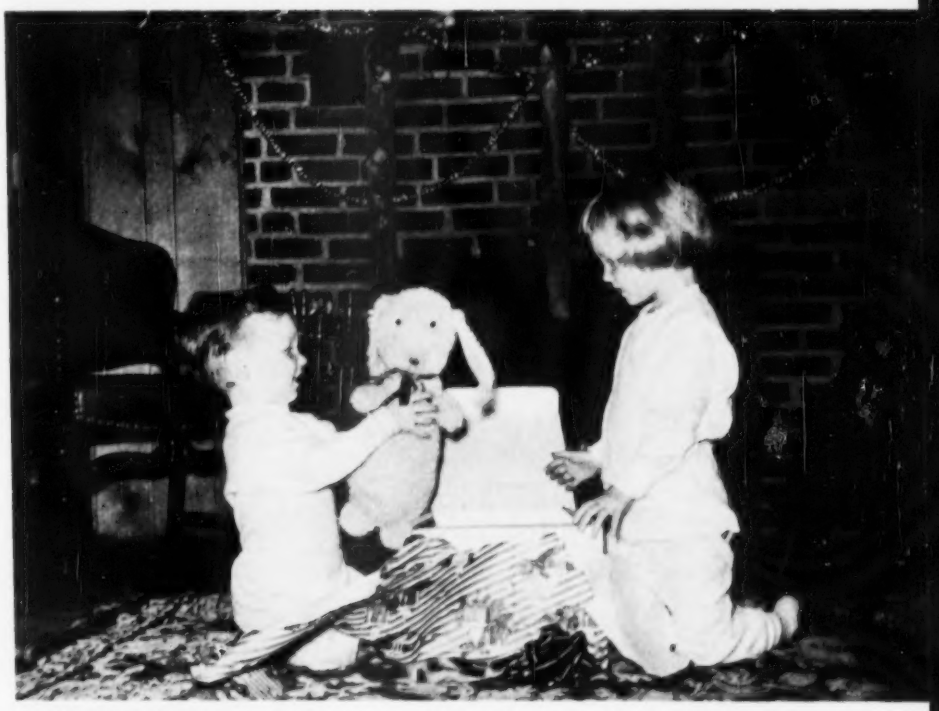
Diffused off-camera flash, bounced off the ceiling from a high mounted reflector, gives pleasant light for family group. Here, because light was weaker, the shutter was set at "L" ("T" on some cameras) to take advantage of full duration of flash from the bulb (about 1/25 sec).

BOUNCE

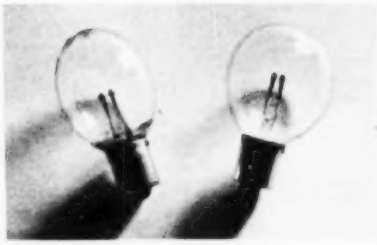


MULTIPLE

Three-flash setup is required for situations that need illumination in depth, like this interior. Three No. 5 bulbs were used here: one hand-held off the camera, one at right in middle distance to light the children, and one inside the dining room, also at right. Lamp and ceiling fixture were left on for natural effect. Calculation of lamp to subject distance gave a guide number of 110, and exposure was made with "open flash" technique and aperture setting of f/16.



ACTION



Action-stopping with a simple camera is possible if you use high-speed gas-filled SM or SF bulbs, which have a flash duration of about 1/200 second. This is as good as using a camera with a shutter speed that fast. Especially in pictures of active children, the difference between 1/200 and the 1/25 or 1/30 means the difference between sharpness and blur. In the picture of the two bulbs, the SM is at left, the SF at right; they are essentially identical. Be sure there is not much other light in the room; this might cause "double-image" effect. The shot above was made at "instantaneous," f/11.

SYNCHRO-SUN

Fill-in flash lightens shadows and reduces contrast in pictures made with bright sunlight. This outdoor portrait, without fill-in, would have had black shadows on the face, under nose and cheekbones, and much less detail in the coat. No change in exposure is necessary with the addition of the flashbulb. Here the camera was set at "instantaneous," f/16, with an SM bulb.

TRIPLE EXPOSURE

Unusual effects, like this montage of three portraits, are possible with flash. This is not a true montage, but a triple exposure on a single negative. (The camera used had double-exposure-prevention device, but also release for intentional multiple exposures.) Model was draped in black cloth and shot against a black night sky, with SM bulbs in diffusing reflector, at f/16.

CLOSE-UP

Close-up flash pictures are easy to make with either direct or bounce light. This child was photographed at a distance of 23 inches, using a close-up attachment on the camera, and a No. 22 flashbulb in a reflector held off the camera and aimed at the ceiling for bounce illumination. This bulb gives four times as much light output as the smaller No. 5, and here permitted use of normal box-camera aperture, about *f*/11.

Bounce flash is good for color, too

ONE-LAMP CEILING BOUNCE
The Ektachrome at right was made with setup shown above; 9-ft-high white ceiling, 9-ft-wide background, side "walls" of 8-ft white sheeting stretched taut on wooden frame were designed to give maximum overall reflection. Flashing tube was clamped with ball-and-socket head on light stand elevated to about four feet from ceiling. This produced a bounce distance (from lamp to ceiling to child) of about 10 feet. The Strobonar V's guide number of 40 for this film indicated exposure at *f*/4, but was cut one stop to *f*/5.6 because of highly reflectant surfaces. To avoid shadow under eyes, shot was made when child tipped head back.

By GEORGE WISLER

ONCE you take a look at the pictures of a young child on the opposite page, the advantages of using bounce techniques for your flash pictures should be obvious. Long a familiar method for taking black-and-white pictures, bounce flash with color film has been avoided by most amateurs as being too full of problems to be practical.

Problems there are, and it is true that you are more limited than with black-and-white, but look at the advantages: softer, more plastic skin tones than with direct flash; greater freedom in varying your shooting position; less worry about troublesome shadows—it's always difficult to predict their position with flash, and you won't discover that harsh black shadow falling across your subject's mouth until after the film has been processed and it's too late to do anything about it. The bounce technique is especially good for portrait sessions with young children, who can be easily upset by repeated flashes of strong light in their eyes. So much for the advantages—the problems are more easily overcome than you might think.

The most important difference between bounce flash for color and the same method for black-and-white is the necessity of having a white surface to bounce the light back to the subject. If you use any other color, that hue will be reflected too, and the normal color reproduction distorted accordingly. A light gray is all right too—as long as it is a pure variation on white and not a tinted gray. Most household ceilings are white, so you're all right there for bouncing directly overhead; if the room is small, however, and the walls painted a definite, strong color, you may get a reflection of that tone on the subject. Therefore, it's wise to try a trick I used in the illustrations at right: hang up some wide, white sheeting material on the walls on either side of the subject. If you feel handy with a hammer, make a wooden frame on which to stretch the material taut—it'll make a better reflector if it's tight. The material should reach all the way to the ceiling, almost to the floor, and at least four or five feet past the subject on both sides. If you're worried about color reflections from the wall in back of the subject (a legitimate worry in a small room), hang a sheet there too, or a movie projection screen. If the subject is placed as far away from the fourth wall as practicable, you will most likely not encounter color reflections from that source.

To compute the exposure you must measure the actual distance the light will travel—from the lamp to the ceiling or wall back down to the subject. This distance is then divided into the guide number for the film-lamp combination you're using. I use electronic flash (and daylight-type film) because I like to be able to keep shooting when I see my subject expressing himself, and not have to change lamps for each shot. With the flash tubes of my Heiland Strobonar units clamped with an auxiliary ball-and-socket tripod head to the end of a light stand, I am free to tilt the reflector to the ceiling or wall in a second, and to raise or lower it if I want to change the bounce distance to get a different exposure.

If you have only one lamp unit the best bet is ceiling (*Continued on page* 103)

DOUBLE-LAMP WALL BOUNCE
Picture at right was made with two lamps on 7-ft-high light stands, reflectors directed just below junction of wall and ceiling for highest light reflection. Bounce distance here was about 8 feet; Strobonar IV's guide number of 80 indicated exposure of f/10, but was stopped down to f/16 because of high over-all illumination from white surfaces. In general, two-lamp wall bounce needs about one stop less exposure than one lamp off ceiling. Results are quite similar, with shadows a bit softer with wall bounce, more over-all light.

DIRECT, ON-CAMERA FLASH
This picture shows what happens when the flash is used on the camera, throwing a great blast of light at the innocent subject. With reflector in line with center of child's face, the light is spread evenly, casting no shadows to model and characterize the delicate features. In addition, direct light from a polished, undiffused reflector is "sharper" than diffused bouncelight, and not as flattering in pictures of people. Exposure at 4 feet, Strobonar V, f/11. (In all color shots, a CC10Y—yellowish—filter over lens cut excessive blue of electronic flash with daylight-type film. Direct-flash shot is a bit bluer than the others, since even the whitest surface is slightly yellow, tending to warm up the bounced light.)

What you should know about

flash and the new color films

Pictures and text by **MORRIS GORDON**

Although I have been making flash and speedlight exposures on Kodachrome, the old Ektachrome (E-1), and the now discontinued Ansco Color Film for many years, it wasn't until very recently that I had a chance to try the new faster color films with my favorite flash sources. As this report is being completed, the new films are available in only three emulsions—Kodak Ektachrome (E-2) Daylight Type, Anscochrome Daylight Type, and Ektachrome (E-2) Type F, which is balanced for clear flashbulb illumination other than M-2, SM, and SF.

The big questions are: Which film and flash source produces the most pleasing results? How do the colors vary from film to film and light source to light source, if at all?

With the two daylight-type color films, I used electronic flash (my Ascor 201 Speedlight) and G-E No. 5B flashbulbs, which are coated with a blue-dyed lacquer; with Type F Ektachrome, I used G-E No. 5 (clear) flashbulbs. The ac-

BLUE PHOTOFLASH bulbs (G-E No. 5B) employed with Daylight Type Anscochrome film produce lush, yellowish flesh tones; slight magenta overcast adds purplish hue to neutral gray carpeting as well as to highlights in subject's hair. Inherent soft gradation of Anscochrome film produces transparent, detailed shadow areas, retaining original coloration of subject.

ANSCOCHROME DAYLIGHT TYPE TESTS

ELECTRONIC FLASH illumination (Ascor 201 Speedlight was used) coupled with Daylight Type Anscochrome accentuated magenta overcast apparent in blue flashbulb exposures despite use of recommended ultraviolet absorbing filter. Result is quite acceptable for viewing and photomechanical reproduction despite reddish hue of flesh tones and other slight color distortions. Long gradation scale of film is retained.

even the whitest surface is slightly yellow, tending to warm up the bounced light.)

companying color reproductions show the best comparable exposures that I achieved with each of the five film and flash source combinations I tested. Since certain quality losses are inevitable in reproducing the test transparencies on the printed page, these illustrations have been supplemented with the description and interpretation that follows.

Since I was starting from scratch, the only approach I could use in attempting to produce transparencies of equal density and color saturation for comparison purposes was to start with the flash exposure data given in the instruction literature for each of the films under test and then overexpose and underexpose each in half stops. This is the well-known bracketing procedure used by professional color workers who must necessarily turn in the best possible result.

All exposures were made with the same f/3.5 Automatic Rolleiflex, on 120 roll film; photoflash shots were made at 1/50 second. (*Continued on page* 90.)

EKTACHROME TYPE F TEST

CLEAR FLASHBULBS (G-E No. 5's were used) and Type F Ektachrome produced accurate reproduction of subject colors and pleasing brilliance—an ideal combination for indoor color flash except when the room is flooded with daylight that would affect color rendition. Type F Ektachrome is slightly softer than the Daylight Type, yet not quite as soft as Anscochrome—test results illustrated on facing page.

EKTACHROME DAYLIGHT TYPE TESTS

BLUE FLASHBULBS produce same lush yellow flesh tones with Daylight Type E-2 Ektachrome film as with Anscochrome on preceding page, but other colors are more faithful to original subject. Relatively short gradation scale tends to block up shadow detail.

ELECTRONIC FLASH and Daylight Type E-2 Ektachrome film make a successful combination despite relatively low guide number (35 for 100 watt-second Ascor 201 unit). Flesh tones, grays, and secondary colors are extremely accurate; gradation, brilliant.

Halsman's portable speedlight studio

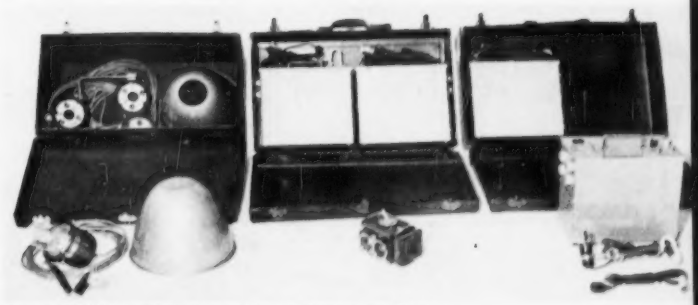
By NORMAN C. LIPTON

LAST spring, still another chapter was written in Philippe Halsman's fascinating photographic career, which has been studded with many unusual assignments and shattered precedents. He embarked for Europe, early in March, with a fully equipped portable speedlight studio—to photograph some of the foremost figures of the political, social, and entertainment worlds in England, France, and Italy.

The three-month trip was financed by the widely circulated British weekly, *Picture Post*, in exchange for first publication rights to all the pictures that Halsman made in Europe during his travels. It represented the first time ever that a British magazine had invited an American photographer to visit Great Britain to shoot British subjects.

It was also the first time that a lighting manufacturer had designed a light unit not in his laboratory but expressly to the specifications of a working photographer, and—before putting the unit into production—subjected his product-to-be to as critical a field test as a European trip. For the (*Continued on page 90*)

Production model of AA-601 Ascor speedlight, field-tested by Halsman on European trip, was used for color action study of dancer Sigyn Lund; 1/400-sec flash speed imparts a slight blur to the moving hands.



Speedlight outfit tested by Halsman on European assignment tour was tailor-made for his standard lighting setup, top; lamps may either be plugged into individual powerpacks or into four outlets of a single pack. Equipment packs away in three cases.

NEXT PAGE

Halsman portraits on two following pages of Pierre Mendes France, Audrey Hepburn, and Mel Ferrer, were made with portable speedlight outfit.

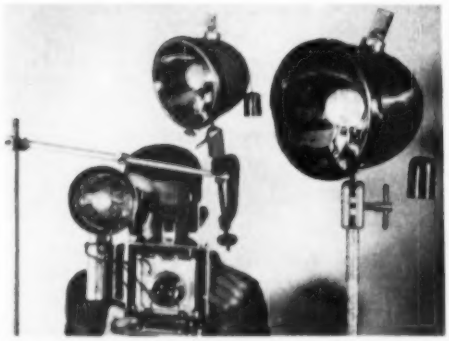
Multiple flash—

wires

and

slaves

Wired flash components are all connected to B-C pack, which is shown here attached to the camera. These extension units are specially designed for multiple flash, but any clamp-on reflector can be used, with adapter if you use bayonet-base bulbs. Units like those shown here have outlets for both B-C and ordinary battery operation, and can be connected together in series with extension cords.



Wireless flash is made possible by "slave" units, which are basically self-contained B-C flashguns with heavy-duty power supply, activated by photoelectric cells atop the reflectors; bulbs in the slave units are set off by an impulse from the flash connected to the camera shutter. Slaves are relatively expensive, but extremely versatile. They can also be used as wired flash units if desired.

By RUS ARNOLD
Photographs by the author

BECAUSE the results of extension flash are often so very dramatic, some photographers are afraid to try it. Yet it is really simple, if you tackle it the right way. There are two tools at your command: regular flash connected to a B-C unit by extension cords of any desired length; and "slave units," which set off flashbulbs with a self-contained B-C unit on an impulse from a photoelectric cell at the instant another bulb is fired.

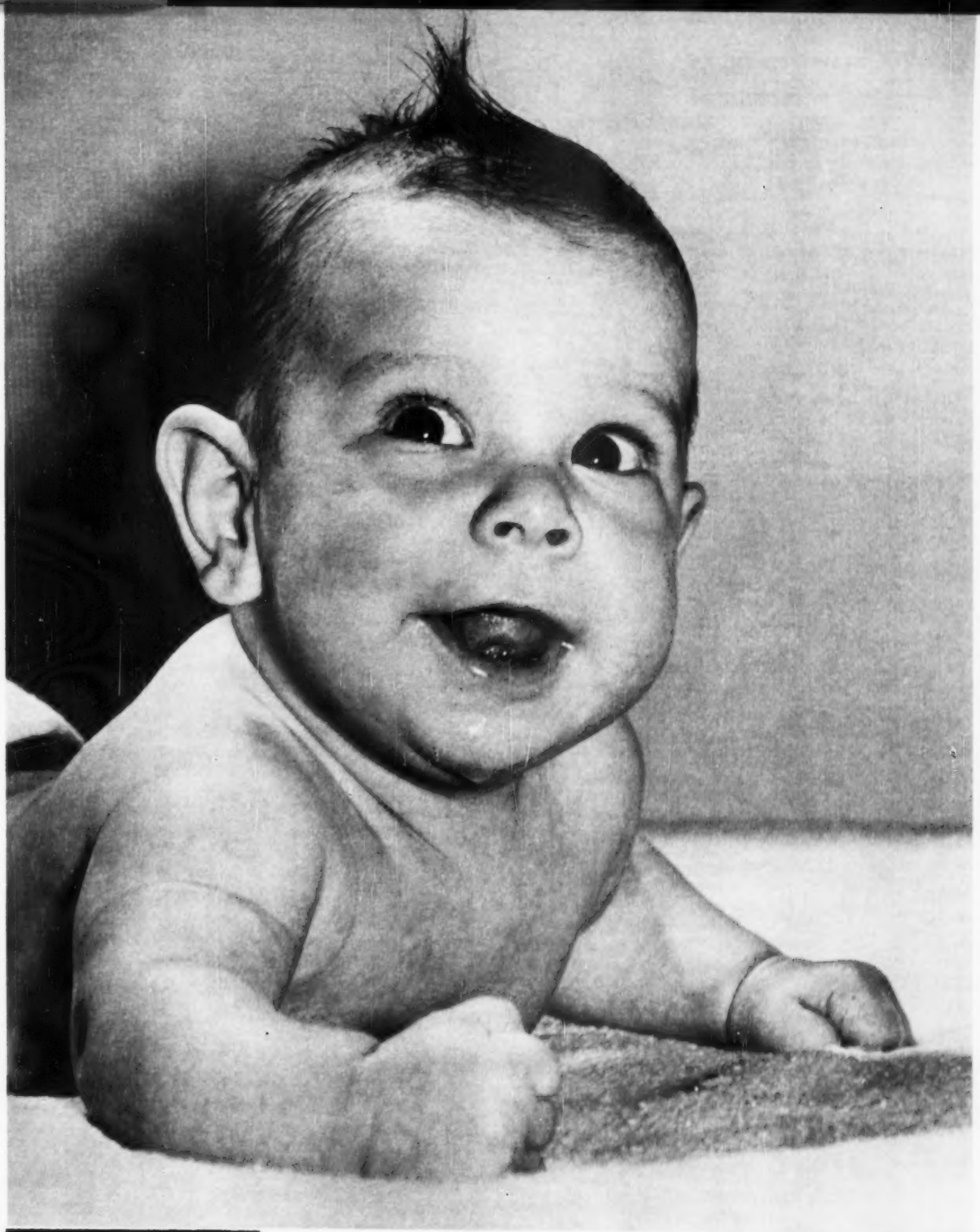
Let's talk, first, about what type of picture calls for extension flash. For one thing, a picture that requires more light, a smaller lens opening, or a faster shutter speed, a picture involving action, a picture requiring depth of field—these are technical situations that call for extension flash.

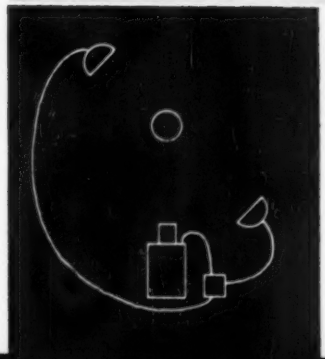
In addition there are situations where the picture quality—the feeling—calls for extension flash: pictures involving the controlled play of light on the subject, pictures requiring texture, definition, modeling.

You can look at it this way. Any picture that has to be taken quickly, unobtrusively, with no setup, calls for available light, straight flash, or bounce flash. On the other hand, if you can set the picture up, compose it, and arrange it, you might as well control the lighting to the fullest.

If you have just a little more time than available in the hit-and-run situation, you can have somebody hold an extension flash. If you have time to set a camera up on a tripod, focus critically, check depth of field, compose, plan, then you might as well set up one or more carefully placed extension flashes.

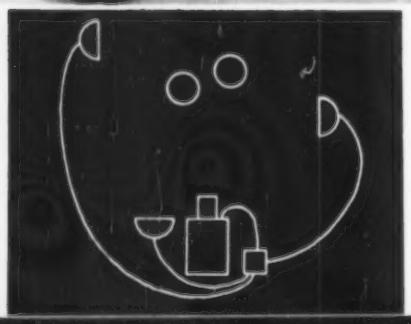
Interestingly enough, it works the other (*Continued on page* 152)



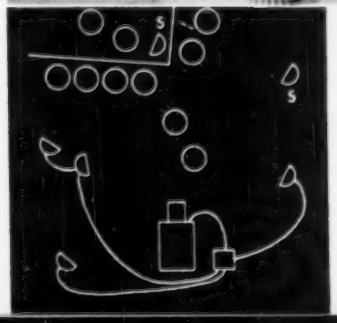


Wired flash in use is illustrated by this animated-child portrait, which was made with two small flashbulbs, both off the camera. In the diagram at left, the circle represents the subject, the semicircles are the flash reflectors, and the small rectangle is the B-C pack which furnishes power for the flashes. For this picture, almost all the effective light came from the bulb at right, and exposure was based on its distance from the subject. The other reflector was placed well above camera level, to act as backlight and top-light. In such an arrangement, be careful that the lens is shielded from direct light, to avoid flare. Two Bantam 8 flashbulbs were used for this shot, and the camera was a 4x5 view with a 10½-inch lens—longer than normal, for the striking close-up effect.

continued



Triple wired flash got this photograph of two researchers in the "cold room" at Presbyterian Hospital in Chicago. This is a good demonstration of the stamina of B-C units; with the temperature at freezing, B-C performed perfectly, where batteries alone might have slowed down or stopped operating altogether. For this shot, the mainlight was a Press 25 bulb in reflector at right; another 25 was placed at left rear for dramatic back- and sidelighting. To insure against totally blocked shadow areas in the foreground, Arnold used a small Bantam 8 bulb in another reflector beside the camera for fill-in. Here, again, exposure was based on guide number for mainlight, disregarding second bulb.



Slave units plus wired flash were required for this elaborate setup showing children examining exhibits at the Chicago Museum of Science and Industry. There are ten people in the picture, and there was a great problem of lighting in depth. Arnold planned the lighting scheme shown in the diagram at left. Four flashbulbs in reflectors were connected to the B-C pack: one at right, one at left as crosslight, one pointing toward control room, and one for the large disk in foreground. Slave units (designated by letter "S") were placed at right background and inside the control room; the latter's photoelectric cell was activated by the extension flash at left background. Result: even lighting over-all.

1 Underexposure

WHAT CAUSED IT Too small a lens opening, wrong-class lamp, or faulty synchronization.

HOW TO PREVENT IT Determine lens aperture by dividing flash-to-subject distance into guide number for film and shutter speed employed. With bounce technique, compensate for loss of light by opening lens two to three stops. Use lamps designed for camera's shutter. Synchronization tests appear in Flash Equipment article.

2 Overexposure

WHAT CAUSED IT Too large a lens opening or too large a lamp.

HOW TO PREVENT IT Follow procedure for determining aperture as in underexposure prevention. If aperture cannot be used, increase shutter speed or back flash away from subject. As guide numbers are different for varying classes of lamps, film types, and shutter speeds, check them every time a change is made.

Don't make these common

5 Shadow on wall

WHAT CAUSED IT Subject is too close to the background with direct-flash method.

HOW TO PREVENT IT Where possible, keep the subject away from background. Another method is to place a separate lamp behind the subject. This may be a connected flash or a floodlamp aimed at the background. Exposure is based on mainlight only. With off-the-camera flash, hold the mainlight high to throw shadow down.

6 Reflections

WHAT CAUSED IT Mirror or any highly polished surface behind the subject.

HOW TO PREVENT IT If flashing unit cannot be removed from camera, do not place subject in front of any surface which will throw flash reflection. With removable units, use sidelighting or bounce the flash 90 degrees away from subject. Always remember to keep the reflector out of lens-coverage range.

3 Hotspots

WHAT CAUSED IT Lamp improperly seated in front of reflector or using an excessively "hot" reflector.

HOW TO PREVENT IT Use proper combination of reflector and lamp. With adapters and smaller-sized lamps, the lamp should be centered at the focal point of the reflector. If not centered, use a smaller or larger reflector as needed. Also check the reflector to see whether it has been bent out of position.

4 Uneven light

Special photographs for POPULAR PHOTOGRAPHY by Peter Gowland

WHAT CAUSED IT Reflector turned away from subject for straight flash or not turned far enough for bounce.

HOW TO PREVENT IT With on-the-camera flashing units, reflector must be aimed directly at subject. For bounce technique, flash should be turned at least 90 degrees away from subject, using a larger lens opening to compensate for loss of light. Read articles on bounce flash appearing throughout this issue.

flash errors

7 Double image

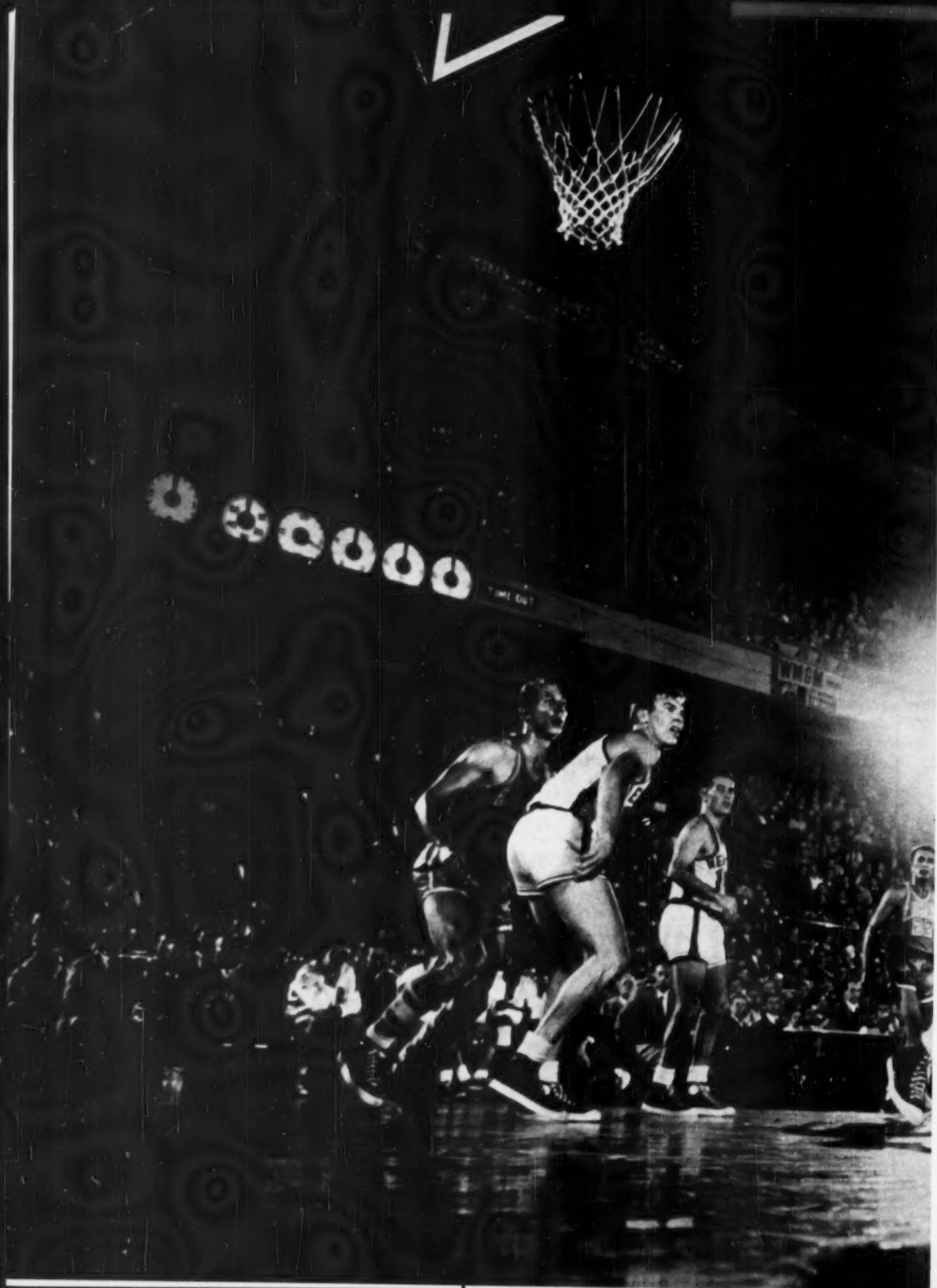
WHAT CAUSED IT Level of existing light recorded on film with lens set for flash exposure.

HOW TO PREVENT IT Daylight, even when only fairly strong, will record a moving image before the flash exposure "freezes" the subject on film. Therefore, use fastest shutter speed possible to underexpose daylight effect or where possible draw draperies or close blinds to cut down level of existing light.

8 Too much fill-in

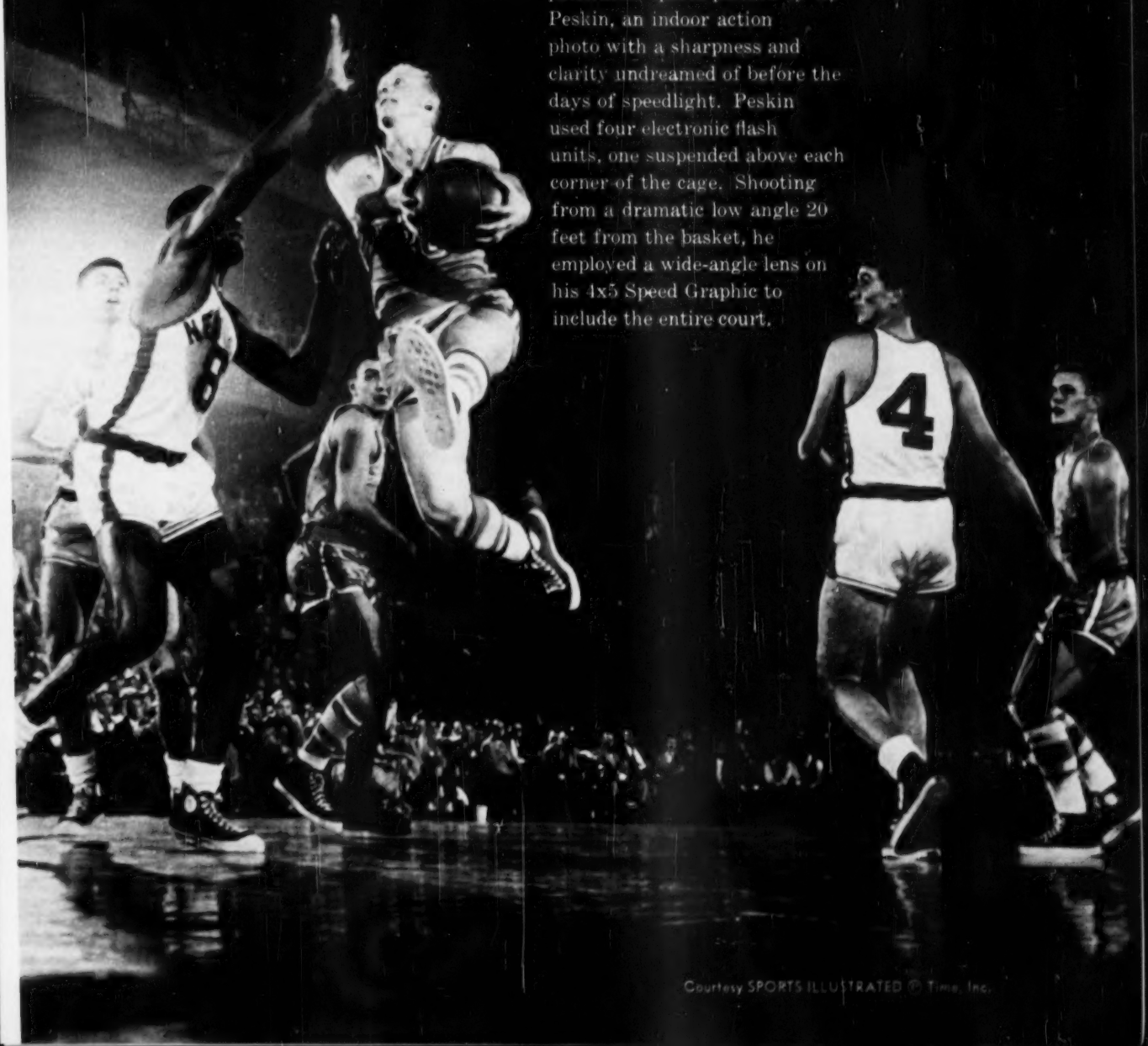
WHAT CAUSED IT With fill-in flash, exposure was not based on prevailing light conditions.

HOW TO PREVENT IT When existing light is bright enough to record subject and background on film, exposure must be based on it, not on the fill-in. Lamp should be kept as far away as possible to soften shadows, not to bleach them. If flashing unit cannot be removed from camera, use a diffuser or handkerchief over reflector.

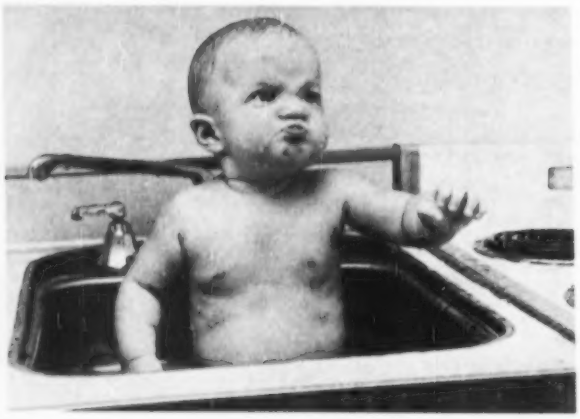


Pictures with flash

FLASH—electronic or conventional—is merely the means to a photographic end—better pictures, more exciting pictures, no matter how bad the existing light or how difficult the circumstances. This portfolio shows some of the infinite versatility of modern flash as used by experts to create a variety of effects from simulated natural light to stroboscopic multiple images. On this spread is reproduced a spectacular panoramic sports picture by Hy Peskin, an indoor action photo with a sharpness and clarity undreamed of before the days of speedlight. Peskin used four electronic flash units, one suspended above each corner of the cage. Shooting from a dramatic low angle 20 feet from the basket, he employed a wide-angle lens on his 4x5 Speed Graphic to include the entire court.



Courtesy SPORTS ILLUSTRATED © Time, Inc.



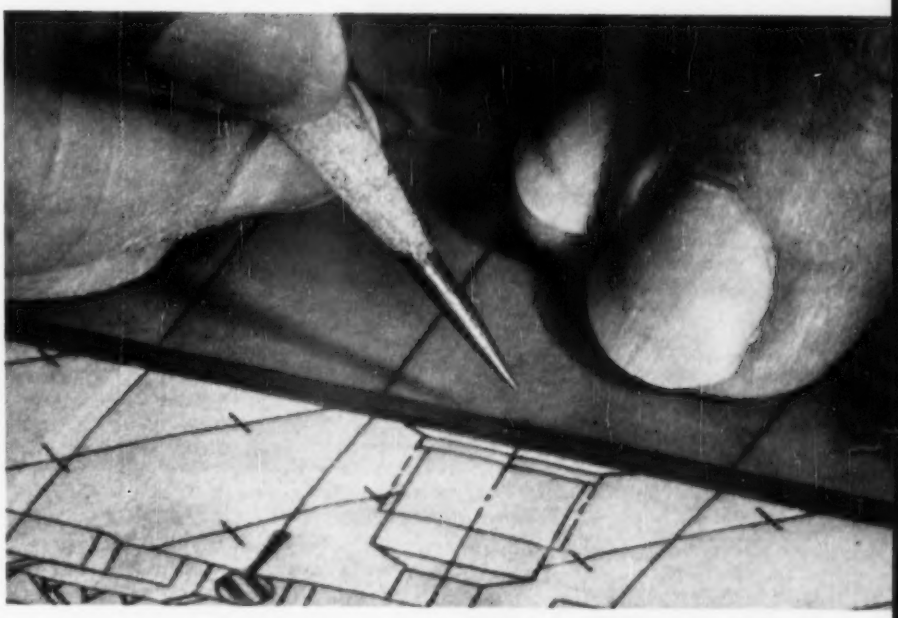
BOUNCE AND BACKLIGHT

When Carl Purcell wanted to shoot some candid baby pictures, left, he naturally turned to bounce flash—a cool, convenient, and simple lighting technique. Using one portable speedlight unit, he reflected the illumination from the corner of a light-colored wall, and stopped down to *f*/11. Film was Super-XX. Purcell says, "The baby was put in the sink in the hope she would make some cute faces during her bath . . . results were even better than expected." Two flash units were employed by Bill Hughes for his well-composed photo of a nude in a basket chair, right. He placed one light behind the subject to cast a shadow of the chair into the model, and bounced the second light to provide soft, diffuse fill-in illumination. His camera was a 4x5 Graphic View, and his exposure was 1/150 second at *f*/32.

PICTURES continued

FLASH—SOFT AND SHARP

The three pictures on these two pages—all made with flash—demonstrate the diversity of effects possible even with simple equipment. Dramatic close-up of girl's head, left, was photographed by Hugh Bell with a Leica and a single No. 25 flashbulb bounced from overhead to simulate natural light. Bell also made the picture at top right, which records a moment of elation backstage as actors read the first—and favorable—reviews of their show. Here Bell supplemented the very poor available light with two No. 5 flashbulbs, one bounced from each side to recreate the effect of the original lighting. This also was a 35-mm shot, with Plus-X film exposed for 1/50 sec at $f/5.6$. Extreme clarity and sharpness were achieved by Joe Clark in his POPULAR PHOTOGRAPHY prize-winner at right. Direct speedlight from one side and a 50-mm lens at $f/22$ produced the desired razor-sharp image clarity.



MULTIPLE IMAGES

True stroboscopic photography is the use of a rapidly repeating flashtube which records multiple images and shows the pattern of motion. The interesting example above is by Yasumasa Nishiyama, and won a prize in the 1955 POPULAR PHOTOGRAPHY International Picture Contest. The photographer used a Rolleicord loaded with Konipan film, and opened up his Xenar lens to *f*/3.5. Shutter was left open during leap.

By BOB SCHWALBERG

all about ELECTRONIC FLASH

PART 1

ELECTRONIC FLASH— WHAT IT IS AND WHAT IT DOES

Electronic flash is usually thought of as the very newest and most modern idea in photographic lighting. Actually, as is the case with so many of our modern gadgets, it is merely a dressed-up version of an idea which dates back to the 1850's when photography was still in its awkward infancy.

In those early days, camera shutters were very crude affairs quite incapable of making the short exposures necessary to obtain sharp photographs of rapidly moving objects. Many experimenters dreamed of being able to make high-speed photographs which would freeze the fastest action. One of these was William Henry Fox-Talbot, the great British photographic pioneer who was the first to fix the photographic image with hypo. In 1851 Fox-Talbot received a patent for the use of a high-speed electrical spark as a photographic light source.

The method for making spark photographs, as finally "perfected" in the 1880's and '90's, was rather cumbersome. An ancient type of electrical generator, the Wimshurst static machine, was rapidly hand-cranked to build up a large charge of static electricity which was stored in a series of Leyden jars, forerunners of the modern capacitor. Two wires led this charge from the Leyden jars to an open-air spark gap. When the electrical circuit was closed, a blinding flash of electricity would leap across the spark gap, giving a flash which lasted for as little as one millionth of a second. To take the picture, a photographer would open his shutter—or simply remove the lens cap if he didn't use a shutter—fire off his spark, and then close the shutter.

Exactly eighty years after Fox-Talbot's spark patent, Dr. Harold E. Edgerton, a professor at the Massachusetts Institute of Technology, made three important improvements in spark photography. Instead of the old Wimshurst generator, Edgerton used a-c line current. The Leyden jars were replaced with modern electrical capacitors. But, most important of all, Edgerton did away with the open-air spark gap and used a glass tube filled with very rare gasses like Krypton and Xenon. The gas-filled tube proved impressively more powerful and more reliable than the open-air gaps, and could be packaged in compact reflectors that were easy to handle.

In the two and a half decades which have followed Edgerton's original researches, many improvements in modern spark photography have taken place and Edgerton has become a living legend in photography. Today the market is almost bursting with portable speedlights of many types and shapes, and these units are becoming increasingly popular with amateur and professional photographers alike. In this article we will cover portables up to about fifteen pounds.

All of these modern units are first cousins to the early spark machines of almost one century ago. Within their sleek power-pack cases, a power supply builds up a large charge of direct current which is stored in one or more capacitors. When the unit is triggered by the contacts in your camera shutter, these capacitors pour their energy into the gas-filled flash tube and we get a brief blast of brilliant light.

The popularity of modern portable speedlights rests largely upon five major advantages which they offer:

1. **Short flash durations ranging from as long as 1/500 second to as short as 1/5,000 second.** Even the slowest will stop most commonly encountered action and eliminate the problem of camera movement.

2. **The ability to make consecutive flash pictures very rapidly.** With electronic flash we do not have to change bulbs after each shot as we do with conventional flash employing expendable lamps. Instead, we must simply allow the power pack sufficient time to refill the capacitors again. This recycle time varies from unit to unit, the longest, about 15 seconds.

3. **Extremely low cost per flash.** The cost of operating electronic flash units from a-c line current and from rechargeable storage batteries (which are recharged on a-c line current) has been estimated to be approximately 1/10 cent per flash. With expendable dry batteries the cost varies from ½ to two cents.

4. **Less tendency to block-up.** The soft light output of modern electronic flash units produces far less blocking-up of foreground objects as compared to conventional flash. In addition, speedlight has a curiously penetrating quality which does much to reveal texture and gradation without the high contrasts normally encountered with conventional flash.

5. **Less subject discomfort.** A by-product of the short flash durations of speedlights is their easy-on-the-eyes quality. People do not spend several minutes blinking after a speedlight picture has been taken, and the light can be used with children and animals which are frequently annoyed by flash.

PART 2

HOW TO BUY AN ELECTRONIC FLASH UNIT

Before purchasing an electronic flash unit it is important to make an estimate of the type and amount of use you intend to give it. Will you make ten or twelve flashes every month or so—or will you make several hundred flashes per month? When you shoot speedlight pictures, will you flash a few pictures—or will you shoot many pictures rapidly in a short period of time? Will most of your shooting be indoors in your home or studio—or will you be shooting out-of-doors and in places where you cannot make use of a-c lines? Will you shoot black-and-white, or color, or both? Will you shoot by direct light, bouncelight, multiple-extension flash, or all three? In other words, what are you going to do with the speedlight, and how often do you plan to do this? One word of warning: It is not safe to base your answers to these questions solely upon your past performance with conventional flash. Chances are nine out of ten that with speedlight you are going to make many more flash pictures than you ever did when each shot cost you from ten to twenty odd cents apiece, and you had to change bulbs between shots.

The answers to these questions are going to help decide the type of electronic-flash power pack that will best suit your purposes. There are three basic types of power supplies used for modern portable speedlights. These are: (1) a-c line current; (2) rechargeable storage batteries; (3) non-rechargeable dry-cell batteries. Some units offer a choice of interchangeable power packs and others allow you to use a-c line current as well as either storage or dry-cell batteries. At least one unit actually permits the use of all three types of power input. Each of these power sources possesses inherent advantages and disadvantages:

Advantages of a-c line operation: Alternating current affords the lowest cost per flash possible with speedlight—probably less than 1/10 cent per flash. When operating off a-c lines you need never worry about whether your power pack is properly charged, as you must with either type of battery power pack.

Disadvantages of a-c line operation: The most obvious disadvantage involved with a-c line-current operation is that you must be near wall outlets and thereby sacrifice a certain degree of mobility. A-c operation also involves the longest waiting period, or recycle time, between successive flashes with most portable units on the market today. This usually amounts to a 12- to 15-second delay between pictures which may or may not be a disadvantage. Many straight-a-c units operate with very brief flash durations such as 1/5,000 second, which gives them excellent action-stopping power, but these units usually give rather poor exposure guide numbers.

Units designed for a-c line operation only are, in the main, cheap, rugged, and dependable. They are to be recommended to the man who confines his flash work to the home, studio, or other locations where a-c power is available. A-c line operation can, however, also be obtained as an accessory with fully-portable battery-powered portables.

Advantages of storage-battery operation: Storage-battery operation affords full mobility with a cost per flash only very slightly higher than straight a-c line operation. Storage batteries are rugged and dependable, and will last for many years, with adequate care in charging. A new type of storage battery now receiving much attention in the electronic-flash industry is the nickel-cadmium cell which is sometimes guaranteed for as much as ten to fifteen years, and which requires a minimum of recharging and general maintenance.

Disadvantages of storage-battery operation: The major disadvantage of storage-battery operation is the increased weight of the units which require, in addition to the heavier storage batteries, additional electrical components such as vibrators and transformers, which add weight and bulk. Storage-battery power packs usually require recycle times somewhat shorter than a-c line operation but considerably longer than high-voltage dry cells. The batteries must frequently be recharged, and although one charge is generally good for about 100 flashes, normally not more than 60 to 80 may be taken from the unit during a brief shooting session. Nickel-cadmium cells approximately double both of these flash figures and are about as effective in this respect as dry cells.

Storage-battery-powered speedlights are a very good choice for the casual flash shooter. Most will also operate on a-c line current and in some units the battery is actually undergoing recharging when the unit is used with a-c. The cost of operation is very low, but they do need a certain amount of careful maintenance.

Advantages of expendable dry-battery operation: Dry-battery portables usually offer the fastest recycle time between flashes. With different units this varies from three to six seconds. The high-voltage dry batteries usually have a one-year shelf life and will deliver approximately 1,000 to 2,000 flashes. Professional photojournalists rely on these units because they can deliver as many as 300 consecutive flashes in a relatively brief period of time. Because of various factors discussed in the section dealing with reciprocity, they yield very high exposure guide numbers in relation to their weight and electrical power ratings (in watt-seconds).

Disadvantages of expendable dry-battery operation: The biggest drawback in using expendable dry batteries is the increased cost per flash. Actually, this isn't high, running up to about two cents per flash. But high-voltage dry-battery power packs usually cost from about $12 to almost $20 per battery or set of batteries as required by individual units. High-voltage dry-battery power packs are not always a good investment for the very casual flash shooter who makes pictures only occasionally. Some low-powered lightweight units are now powered by a number of

fifteen-cent, volt-and-a-half dry cells. Such units provide most of the advantages of dry-battery operation while eliminating the need for constant reinvestment to the tune of twelve to twenty bucks. The cost per flash in such units is actually less than with high-voltage dry cells, but these miniature power packs cannot deliver as many flashes or as great a shelf life. (Incidentally, some manufacturers provide accessory battery "boosters" or "rejuvenators" which extend the life of high-voltage dry batteries considerably. These devices must not, however, be confused with rechargers as employed with lead-acid or nickel-cadmium storage batteries.)

Dry-battery units are increasingly popular today. They provide the most favorable weight to light-output ratios, often outperforming wet-cell units weighing twice as much. Dry-battery power packs require a high initial investment which can last for a maximum of only one year. The cost of operation is further reduced by a number of dry-battery portables which also permit the supplementary use of a-c line current.

The next question is the amount of power which you need. In scientific circles the power output of electronic flash units is variously described in terms of "watt-second input," "beam-candle-power-seconds," "lumen-seconds," etc. These are good and valuable terms, but they do not express the power of a speedlight unit in terms of the way a photographer uses the unit. Photographers buy electronic flash units in order to make pictures, and the only power ratings that really mean anything are the exposure guide numbers for various films. The one guide number that is most significant is the one listed for Daylight Type Kodachrome. In black-and-white photography we have so many different types of developers, enlargers, and general opinions about good negative and print quality that it is not possible simply to accept any guide number listed for a particular film. Kodachrome, on the other hand, is a very uniform product which, at least to this date, is only processed by Eastman Kodak.

Kodachrome guide numbers can be employed as a means of dividing portable speedlights into three basic power groupings:

Low power: Kodachrome Guide No. 25 to 35.
Medium power: Kodachrome Guide No. 40 to 50.
High power: Kodachrome Guide No. 70 to 85.

The low-power units will weigh in at about three to four pounds. Medium-powered dry-battery units will weigh four to seven pounds, wet-cell units somewhat more. High-power portables will run from about seven to fifteen pounds.

Whenever possible, the speedlight unit should be purchased from a reputable dealer who will permit a certain trial period during which the unit may be returned for refund or exchange. During this period you should run a combined **guide-number and beam-coverage test.** This test can be made with color or black-and-white and can be as comprehensive or as brief as your needs dictate. The test can be run with one film or with several. If you want to test several developers or several immersion times in the same developer, you can do this by exposing as many test strips as you require. Here's how to run such a test.

The first problem in running a meaningful test is to select an appropriate location. If the test is made in a small, low-ceilinged room with light-colored walls and ceiling you will obtain higher guide numbers than if it were conducted in a cathedral. Many professionals agree that the best place to test a speedlight is out-of-doors, at night. However, any indoor situation which you feel is typical of the conditions you will normally encounter will do as well. Generally the indoor guide number will indicate a full stop less exposure than is necessary outdoors or in big indoor areas—due to the effect of reflecting surfaces.

In this test we want to check two important things:

1. The amount of light given by the speedlight.
2. The evenness of this light output over the entire negative area.

For the first point, any subject that is representative of your photographic interests will suffice, but girls are probably most fun! In order to check the second point it is best to pose your subject against an evenly colored wall.

It is also a good idea to repeat your series of test pictures at three distances. Our own preference is to test at five, ten, and twenty feet from the subject. Here's the step-by-step procedure to use:

1. Camera on tripod, flash-head aimed accurately at subject. (Tripod ensures that camera and flash-head angle in relation to the subject will not vary throughout the test.
2. Subject holds cards which give the distance and the *f*-stop used.
3. Make five exposures as indicated:
   First exposure: exactly based on manufacturer's guide number.
   Second exposure: ½ stop more than manufacturer's guide number calls for.
   Third exposure: 1 full stop more than manufacturer's guide number calls for.
   Fourth exposure: ½ stop less than manufacturer's guide number calls for.
   Fifth exposure: 1 full stop less than manufacturer's guide number calls for.
4. Repeat at intermediate distance with cards indicating distance and *f*-stops employed.
5. Repeat at far distance with cards indicating distance and *f*-stops employed.

In making this test be careful to give the unit sufficient time to recycle between flashes. If you want to test the manufacturer's rated recycle time, allow several minutes to elapse so that you're sure to have fully charged the unit. Then make a series of flashes using the second hand of your watch to time the waiting period between flashes exactly. If negatives two and three are noticeably thinner than negative one, you can be sure that the rated recycle time is insufficient.

If the test was made with black-and-white, develop fully in the formula you normally use. The section on processing electronic-flash negatives gives information on developing speedlight negatives and how to run development tests.

To evaluate the guide-number and beam-coverage test negatives, first study each distance series carefully and pick out the negative that you feel is best. The card which appears in the picture will give the lens aperture and subject distance. If, for example, the best negative in the ten-foot series was the one made at *f*/8, we obtain a guide number of 80 by multiplying the *f*-stop by the shooting distance in feet. In this event, the best five-foot negative ought to be the one made at *f*/16, and the best twenty-foot negative the one made at *f*/4. But study this carefully because some units have a tendency to overexpose at close distances and underexpose at far distances. In this event it is necessary to use a higher guide num-

ber for very close distances and cut the guide number when shooting beyond about 15 feet.

The second thing to look for is evenness of illumination over the entire negative area. The normal focal lengths used on all cameras from 35-mm on up give an optical angle across the negative diagonal of slightly less than 50 degrees. Almost all speedlight reflectors are designed to give a fifty-degree beam. The question is, however, to find out if the beam coverage works at all shooting distances. Low- and medium-powered units should be tested up to at least twenty feet; high-powered units to thirty feet. At these distances you may find that the edges and corners of the negative are receiving less density than the center portion. This disease is called "hot spotting." If you have any doubts about your "hot-spotting" test you can really see what's what if you make a series with a wide-angle lens such as the 35-mm focal length, which covers 62 degrees on a double-frame (24x36-mm) 35-mm negative. Reference shots made with the 50-mm lens will show the area on the wide-angle negative covered by the normal focal length and reveal any unevenness of illumination.

Once you've decided upon the type of power supply and the amount of power that you need, it's time enough to look at the other features of competitive speedlight units. Here's a brief check list of valuable features:

1. **Weight-to-power ratio.** A four-pound unit giving the same power output as a six-pound unit is obviously preferable, assuming that all other characteristics are fairly equal.

2. **Type of packaging.** There are several ways in which electronic flash units are packaged, and a preference here might be a deciding factor in choosing between two units of similar electrical and photographic potentialities. The basic packagings used in portable speedlights are: (1) separate power pack and flash head with a minimum of weight in the flash head; (2) separate power pack and flash head with condensers contributing some weight to the flash head; (3) separate power pack and flash head with flash head taking the form of a standard flashgun and weighing two to three pounds; (4) unit construction in which the power pack and flash head are united in one assembly.

3. **Flash duration:** As indicated before, electronic flash units with relatively long flash durations ranging from 1/500 to 1/1,000 second are usually photographically more effective than faster units firing at from 1/2,000 to 1/5,000 second. But the latter units will, obviously, stop faster action.

4. **Color temperature:** The color temperature of all speedlights is an approximation of average daylight, ranging from about 5,600 K to slightly more than 7,000 K. The units with Kelvin temperatures of about 7,000 degrees will tend to be slightly bluish with daylight color films and may require the use of a mild warming filter. (More about this in the section on Color.)

5. **Indicator lamp:** Some units are equipped with charge indicator lamps which flash on when the unit has reached about 80 percent of full charge. The advantage of these lights is that the photographer always knows when he can fire. The disadvantage is that the neon lamps used are somewhat photosensitive and will operate differently under different lighting conditions.

6. **On-off switch:** To achieve greater dependability by omitting a possible source of malfunctioning, some units are not equipped with on-off switches. Once you plug the head into the power pack you're on, to turn the unit off to conserve battery power between shots it is necessary to unplug the head. Many photographers, however, appreciate an on-off switch because it allows them more easily to uncouple their power pack.

7. **Half-power switch:** Some of the medium- and high-power portables are now equipped with half-power switches which reduce their light output by one to two full stops. This is a very valuable feature because many units are actually over-powered for close shots with direct flash, particularly when the new fast films are used. In addition to this, in most circuits the low-power switch position conserves battery life and shortens the recycle time between consecutive flashes.

8. **Availability of matching accessories:** In the section on **Taking Pictures with Electronic Flash** we will discuss the use of many electronic flash accessories such as extra flash heads, slave units, extension cords, testers, battery rejuvenators, different types of power packs, etc. The availability of a wide range of accessories is an important consideration if you think that you'll want to extend the usefulness of your speedlight equipment at some later date.

PART 3

THE STORY OF RECIPROCITY

As the early photographic investigators gained experience with their new medium, they began to formulate rules and theories in order to explain photographic phenomena so that people could predict the results of various actions. One of the earliest of these rules was the "law of reciprocity."

The reciprocity law states that exposure is equal to the illumination times the time it is allowed to strike the film.

In other words a light intensity of 100 candlepower striking the film during an exposure of 1/10 second must be exactly equal to the exposure obtained from a light of 10 candlepower allowed to strike the film for a 1-second exposure. And, with light intensity remaining constant, an exposure of 1/1,000 second at f/2 should produce the identical density to an exposure of ¼ second at f/32.

Now, this is all very clear and simple, and no one should have any difficulty in understanding such an obviously logical law. **The trouble is, it just is not so.**

Whenever exposures vary very much from a median exposure of approximately 1/50 second we experience failure of the reciprocity law. If we start with a basic exposure at this speed and then translate this into an equivalent exposure at a very long shutter speed, or a very fast shutter speed, we find surprisingly enough that these exposures are not as effective as our original exposure. If you've ever opened a box of professional Ektachrome you've probably seen the information on the data sheet giving the exposure increase necessary when using camera exposures longer than 1/10 second. This is slow-speed failure of the reciprocity law. In electronic flash our problem concerns high-speed failure of the reciprocity law.

All films do not respond to reciprocity failure in the same way, and some films seem hardly affected at all. Kodachrome, for example, does not show any appreciable failure even when very short speedlight flashes are employed. Ektachrome, on the other hand, does exhibit reciprocity failure. Reciprocity failure is much greater with Kodak Super-XX (being discontinued) than it is with Plus-X. The result is that the speedlight guide numbers used by professionals with Plus-X are identical, or actually higher than, the guide numbers used for Super-XX. All conditions remaining constant, every film we've ever used seems to shed contrast in the face of very fast speedlight flashes.

Reciprocity failure recently caused a reasoning failure which is now causing some concern in the electronic-flash industry. This is how it came about.

When the new portable speedlights employing high-pressure tubes, electrolytic capacitors, and high-voltage dry batteries appeared several years ago, photographers and engineers alike were amazed and pleased to discover that these units gave exposure guide numbers far greater than people then thought possible for units with such low electrical power input. In searching around for the source of this blessing, everyone hit upon the fact that these units possessed flash durations two to three times longer than those generally employed in the older-type units. It was thus assumed that because the new units fired at speeds like 1/800 or 1/1,000 second instead of 1/2,000 or 1/2,500, there was less high-speed reciprocity failure, and this was paying off in higher exposure guide numbers.

"The result of all this," says Milton J. Schwartz, noted electronic-flash engineer, "is that the first thing the customer now asks when he goes into a camera store is: 'How long is the flash duration?' The trouble with this is that reciprocity failure is only one of a number of factors contributing to higher guide numbers with the new units, and it's probably not the biggest reason."

Two other factors contributing to the higher efficiency of modern portables are improved tube design and superior reflector efficiency. The modern flashtubes produce a lot more light per watt-second of energy than the older tubes. These tubes are also very much smaller, and reflector efficiency has gained accordingly. For the large tubes of ten years ago to have the reflector efficiency we now have in today's small reflectors would have required reflectors on the order of two or three feet in diameter, or even larger. And, since no manufacturer ever saw much sales appeal in reflectors the size of washtubs, these tubes were packaged in fairly inefficient reflectors.

The relatively superior reciprocity characteristics of the modern portables with long flash durations does play a part in the high guide-number story. But informed engineering opinion credits the superior flashtubes and more efficient reflector design with playing a much larger part.

PART 4

TAKING PICTURES WITH ELECTRONIC FLASH

Electronic flash is one of the most flexible and versatile of all photographic light sources. It can be used as a source of direct light either on or off the camera. It can be bounced off walls or ceilings to simulate natural-light effects. Two, three, or twenty units or flash-heads may be combined with extension wires or with photoelectric "slave units." Electronic flash is equally at home with violent action and still lifes. All the things you could possibly do with electronic flash would probably require a book of Encyclopedic dimensions. Here, in brief, are some of the most important problems and techniques of electronic flash.

Synchronization: Like early spark photography, electronic-flash synchronization actually consists of open flash. What happens is this:

1. Shutter opens completely.
2. Internal contacts complete an electrical circuit.
3. Speedlight fires.
4. Shutter closes.

From this sequence it can be seen that any shutter speed greater than the flash duration of the speedlight can be used for synchronization. In a totally dark room it will make no difference whether we synchronize at 1/10 second or at 1/500. It is the strength and the duration of the speedlight flash which determines the exposure and the stopping power of the camera. Two side issues, however, determine the shutter speed for synching electronic flash. These are:

1. The type of shutter.
2. The amount of existing light present.

The two most important types of shutters used today are the between-the-lens blade shutter and the curtain focal-plane shutter. Each acts in quite a different manner and presents its own problems. The between-the-lens shutter consists of three or more blades located within the lens cell itself. When you

press the release button these leaves open quickly from the center and then close just as quickly from the edges. No matter what shutter speed you use, the shutter always opens fully before closing. Thus it is possible to synchronize any X or "zero delay" between-the-lens shutter at any shutter speed. In practice, however, most between-the-lens shutters are somewhat less efficient at the highest shutter speeds, where they tend to vignette very slightly. Thus the ideal shutter speed for synchronizing a between-the-lens shutter with a speedlight is usually 1/100 or 1/200 second. However, when it is desirable, these shutters will synchronize perfectly at 1/400 or 1/500.

The focal-plane shutter most frequently used in small cameras is the self-capping type. This kind of shutter consists of two separate curtains, and gives a high-speed range and a range of slow speeds. When you fire the focal-plane shutter at a high speed what happens is that the first curtain starts to rush across the film gate. A short interval later, the second curtain follows it across so that an open slit crosses the focal plane. Obviously, if we tried to synchronize a speedlight with a flash duration of 1/1000 second at a high shutter speed, only the area on the film which happened to be uncovered during that 1/1000 second would receive any exposure. However, when we use a focal-plane shutter at one of its slow speeds it operates quite differently. What happens now is that the first curtain rushes across the film gate to uncover the entire negative area. Then, after the time interval of the slow shutter speed you selected has passed, the second curtain rushes across to close the film gate.

The slow speeds can therefore be used for accurate electronic-flash synchronization because there is an instant during which the entire negative area is uncovered. The speed at which to synchronize a focal-plane shutter is, then, the highest speed at which the shutter opens completely. With some of the top-drawer miniatures this speed turns out to be 1/50 second. Other focal-plane miniatures provide electronic-flash X synch at speeds from 1/20 to 1/30 second.

If we are making speedlight pictures in a relatively dark location, synching at these relatively slow shutter speeds poses no problem. But if there is very much available light present, we may obtain two images, one from the exposure itself and the second from the speedlight blast. Synchro-sunlight techniques in which flash is used as a fill-in to open up shadows when shooting in bright sunlight is therefore not recommended for focal-plane cameras. At certain indoor events such as boxing matches where the ring lights are strong enough to provide exposures of 1/250 at *f*/2.8 or *f*/4, available-light pictures will actually be sharper than speedlight pictures made with focal-plane shutters because of the ghost image recorded by the slow synching speed before the speedlight goes off.

In general, then, electronic flash units should be synched at the highest shutter speeds permissible. With focal-plane shutters of different makes and vintages this will vary between 1/25 and 1/50 second. With between-the-lens shutters the entire range of shutter speeds can be used although the 1/100 or 1/200 are slightly preferable because of the tendency of this shutter type to darken the corners slightly at the highest shutter speeds.

Using Guide Numbers: The guide-number system used in electronic flash photography is exactly the same as used in conventional flash-exposure calculations except that we do not have different guide numbers for different shutter speeds because the camera shutter plays no part in electronic-flash exposure. All exposure control in speedlight is exercised by the lens diaphragm. (Neglecting the use of neutral density filters.) In use we divide the guide number by the shooting distance to arrive at the proper lens aperture.

$$\text{Correct } f\text{-stop} = \frac{\text{Guide Number}}{\text{Shooting Distance}}$$

For example, if a speedlight has a guide number of 50 for a particular type of film and we wish to make a picture from a distance of five feet, we must stop the lens down to *f*/10. If we want to shoot at ten feet we must open up to *f*/5.

In direct-flash photography it must be remembered that objects closer than the distance focused upon—the distance used in the guide-number formula to arrive at the *f*-stop—are going to receive too much light while objects behind the focusing distance will receive too little light. If, for instance, we figure our exposure for a ten-foot shot, a foreground object five feet away will receive four times as much light and a background object twenty feet away will receive one fourth as much light as the main subject at ten feet. This means that our five-foot foreground object will receive two stops overexposure and our twenty-foot background object will receive two stops underexposure.

One of the advantages of electronic flash is that a given amount of overexposure from a speedlight is not nearly as disastrous as an equal amount of exposure with conventional flash or other commonly employed photographic light sources. The theoretical reason for this is somehow tied in with the very short flash durations used in speedlight, but even the scientists are undecided about this. Underexposure with electronic flash is, however, far more serious. In general, if you are interested in some background objects more than twice as far away as your main subject, it is usually desirable to risk overexposure by opening the diaphragm slightly more than you would for your subject distance. The beautifully sharp, long scale of gradation quality associated with electronic flash depends on relatively accurate exposure and development, as we shall see in the section on processing.

Multiple-Extension Flash with Speedlight: There are two very different methods of using multiple-extension flash with speedlight. (1) Two or more flash-heads are wired to the same power-pack. (2) Two or more complete speedlight units—with individual power packs—are either wired together or united by means of photoelectric "slave units." The two methods are quite different.

If we wire two flash-heads to the same power pack, it is obvious that each can receive only half of the total power output of the pack. Thus, if one head by itself gives a guide number of 100, each of the two heads will be one *f*-stop less effective, and our guide number for each of the two heads will drop one stop to 70. At the same time that we are splitting up our power-pack energy and giving it to two flash-heads instead of one, we are also cutting our flash duration in half because two flashtubes can pour out the same amount of light energy in half as much time. Thus a unit having a flash duration of 1/1000 second will jump to 1/2000 second when two heads are employed simultaneously. In addition to all this, whatever electrical losses occur when using one head are at least

doubled when a second flash-head with an extra length of connecting wire is used. Because the extension head is usually used with a longer connecting wire, these energy losses due to electrical resistance can be considerable.

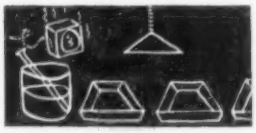
For these reasons it should be understood that when two flashtubes are fired from the same power pack, each flashtube will actually receive slightly less than half as much power as the single head. In black-and-white we have sufficient latitude to ignore losses caused by halving the flash duration and increasing the electrical resistance. In color, however, it is wise to increase exposure by about ¼ stop when using more than one flash-head.

When using a number of separate electronic flash units with individual power packs for each flash-head, the power of all the units is simply additive. If the guide number for one unit is 80, two units will give an extra stop for a guide number of 110, and with three units the guide number will increase an extra stop to 160.

Any number of complete speedlight units can be synchronized to one camera shutter. This can be done by means of trigger wires or by using a photoelectric "slave unit." Any length of triggering wire may be used without causing any loss of light output, although the reliability of the triggering circuit may be impaired when very long wires are employed with certain types of speedlight circuits. The photoelectric cell system for uniting a number of speedlights is by far the most flexible and avoids the maze of wires over which people are continually tripping.

When using photoelectrical cells, one speedlight must, of course, be conventionally triggered from the camera. The light from this unit then serves to trigger all of the other units. Many professionals make a practice of triggering high-powered speedlight units with a very light low-power unit whose light output does not figure in the exposure.

Whether or not your speedlight can be adapted to photoelectric cell triggering depends upon the triggering circuit employed. If in doubt, check with the manufacturer or a competent speedlight service technician.



PART 5

BLACK-AND-WHITE SPEEDLIGHT NEGATIVES

The development of your electronic-flash negatives should be keyed to the contrast required and the guide number adjusted accordingly. In other words, if your speedlight negatives require X minutes in the developer you use, this immersion time should be used to obtain the guide numbers according to which you will shoot. Because negative contrast is affected by the duration of the flash and its color temperature, and because each film reacts to these factors in a different way, the only way in which you can learn the ideal developing time is to make your own set of tests.

In reading about electronic-flash negative processing it is normal to find the recommendation that these negatives be given 50 percent overdevelopment. Actually, this figure is usually excessive. The 50 percent overdevelopment recommendation had its origin in the days when speedlights were operating at flash duration no longer than 1/5,000 second, and usually much faster. Modern portables operating at flash durations between 1/500 and 1/1,000 second are far less subject to reciprocity effects and require far less than 50 percent overdevelopment. With D-23 developer, which is very popular among professional speedlight users, the normal 12-13-minute immersion is stretched to 14-16 in most instances, and some photographers report that even this is often unnecessary.

Again because of reciprocity, we find that some of the slower films actually give the same or higher guide numbers than some of their faster compatriots. Kodak Plus-X and Ansco Supreme are, for example, generally credited with equal or higher guide numbers than Kodak Super-XX or Ansco Super Pan Press films, which have twice the manufacturer's nominal ASA film-speed ratings. These films will, in addition, provide good enlarging contrast for even the softest enlargers with only a slight increase in development.

Under certain conditions it is advisable to use one of the faster films which provide lower contrast and therefore greater insurance against blocked-up highlight areas. This is particularly true when the speedlight is being used on the camera as a direct light and the shooting distances are fairly short. Good choices for this kind of work are Super-XX (being discontinued), Super Pan Press, Isopan, and Super Panchro-Press Type B. The three new American super-speed films, Kodak's Tri-X and Royal Pan, and Du Pont's Superior Press give even better anti-blocking characteristics, but are difficult to use because of the very high guide numbers. With these films one frequently runs out of *f*-stops on the diaphragm and neutral density filters or some other means must be employed to cut down the effect of the light.

In making the guide-number test outlined in the discussion on **How to Buy an Electronic Flash Unit,** it is advisable to make several exposures on separate rolls so that you can try different developer-immersion times. With three rolls of film, for example, you can use your normal immersion time, three minutes additional, and then six minutes additional. Because the majority of roll-film immersion times are close to 12 minutes this will give 25 percent and 50 percent extra.

In general, the lower figure will usually be found preferable with roll film, while sheet film may indicate a development increase of 50 percent. This is not so much because sheet films are flatter (which they really aren't) but because we generally need higher negative contrasts when working with larger film sizes.

Many photographers make the mistake of thinking that speedlight development is somehow related to available-light technique and will attempt to use

overdevelopment as a means of saving underexposed negatives. Within narrow limits it is, of course, possible to increase the density of speedlight negatives by overdevelopment. But where the flash did not reach, you cannot get any worthwhile density increase unless you develop to the extent that you choke up the rest of the negative and increase grain considerably. In addition, the overdevelopment of speedlight negatives undermines the supersharp quality for which electronic flash is famous.

This sharpness is due largely to the fact that the very short speedlight flash durations tend to cause an exposure on the surface of the film emulsion with a minimum of scatter within the emulsion. Overdevelopment causes the small amount of subsurface silver exposed through scatter to be developed along with image-forming silver. In addition, because speedlights are synchronized at shutter speeds greatly in excess of their flash durations, some silver is affected by this camera exposure quite aside from the flash exposure. This is increasingly true when speedlights are used in well-lighted outdoor surroundings. When such negatives are overdeveloped, the appearance of "ghost images" from the camera exposure can cause noticeable unsharpness. The action-stopping power of a speedlight thus depends upon proper development.

The best policy in processing speedlight negatives is to give the minimum development consistent with required negative contrast. Guide numbers should be adjusted to this developing time. False guide numbers obtained through overdevelopment may result in reduced exposure, but you'll pay for this with inferior sharpness, graininess, and contrast.

PART 6

SHOOTING COLOR WITH ELECTRONIC FLASH

The color temperature of electronic flash units generally varies from a low of about 5,600 degrees Kelvin to a high of about 7,200 degrees Kelvin. American daylight conditions also vary in about the same range, and daylight color emulsions are balanced for use with light having a color temperature of 5,900 to 6,000 degrees Kelvin.

For this reason, only daylight color films are used with electronic flash. **(It is theoretically possible to employ tungsten-type color films with electronic flash providing that a suitable conversion filter is used. However, there is absolutely no point to this as the films lose quite a bit of emulsion speed through the heavy filtration required, and this practice is not recommended.)**

Photographers are very much divided in the matter of the necessity for using correction filters for speedlight color with daylight emulsions. Many feel that the speedlights are slightly bluish and compensate for this with one of several light-yellow correction filters. Others feel that filtration is unnecessary. The warming filters most frequently used with daylight roll-film color films exposed by electronic flash are the Ansco UV-15 or UV-16, the Kodak 81 or 81-A, and the very mild blue-cutting Kodak Skylight filter, which gives a slight degree of correction. With daylight Ektachrome sheet films, the CC10Y is probably the most frequently used warming filters.

Because of color film's narrower exposure latitude, color guide numbers should be checked very critically. When in doubt, it is generally preferable to give slightly more rather than less exposure because speedlight underexposures have a tendency toward bluishness. Assuming no filtration, a slight overexposure will usually result in pleasing warmth.

Color films vary in their individual reactions to the reciprocity problem, following the same basic pattern as previously discussed in relation to black-and-white materials. The loss of contrast due to reciprocity failure is, however, very much less of a problem with color films. Certain films such as Kodachrome and Anscochrome appear to have little or no appreciable reciprocity failure except for a very desirable loss in contrast as compared to conventional flash.

Most photographers seem to prefer the reduced contrast of speedlight color transparencies. Many go even further in this direction by bouncing the light off ceilings, walls, or white flats, or filtering the output from the reflector through spun glass, bleached cotton, and other white diffuser materials. When it is desirable to raise the contrast of speedlight color transparencies, this can be accomplished by lighting for contrast or increasing the first development of various user-processed color films such as Ektachrome and Anscochrome.

Bouncelight techniques often cause difficulties in color when the reflecting surfaces aren't pure white or neutral gray. Bouncing a speedlight off a yellow wall or ceiling will, for example, result in a lowering of the effective color temperature of the speedlight and may result in undue warmth. Green and brown walls and ceilings are pure poison and, in addition to absorbing a tremendous amount of light from the speedlight, will usually result in rather poor color, particularly in the flesh tones. One interesting technique that's catching on with many of the pros involves carrying a special umbrella made of white or aluminized cloth which is connected to the lightstand to form a "portable bounce ceiling," thus insuring bounce of uniform strength and color quality.

The modest color guide numbers obtained from portable speedlights makes bouncing relatively difficult, even with the new E-2 Ektachrome and Anscochrome color films. With special processing for ASA 64 or 125, Anscochrome looks like a good bet at this time. Your only guide can be your own personal experience, so make some tests before shooting with serious intent.—

See pages 100-102 for characteristics of available equipment

New Kodak **PANATOMIC-X** Film for the sharpest shots you've ever made!

- **Here's the all-new modern version of a famous film . . . new micro-fine grain, high resolution, superior acutance for sharper pictures . . .**
- ***Plus* balanced panchromatic sensitivity . . . crisp, brilliant tone rendering . . . good exposure latitude and underexposure tolerance . . .**
- ***Plus* new rapid processing that gives you a fully developed negative in 7 minutes . . . enlargements from *dry* negatives in half an hour or so . . .**
- **Your Kodak dealer has it now—or will have it soon—in 35mm and all the most popular roll sizes—ready to go to work for you.**

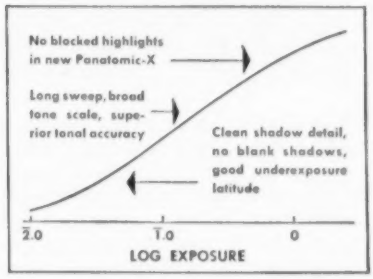
Imagine film grain so fine you can barely find it . . . image sharpness that lives up to the quality of your finest lens . . . fast developing and fast drying that lets you start printing from *dry* negatives about half an hour after your film went into the developing tank . . . a whole stack of big enlargements before bedtime the same evening . . .

That's the new Panatomic-X.

And it's not just a film for the 35mm fan. It will be equally welcome to meticulous workers in the larger roll-film sizes . . . experimenters who like to do radical cropping right on the enlarging easel . . . experts who enjoy the thrill of super-size blowups, up and up from small sections of a fine-textured negative.

New kind of sharpness

Where does all the extra Panatomic-X quality come from? Partly from the new emulsion techniques that gave you ultra-

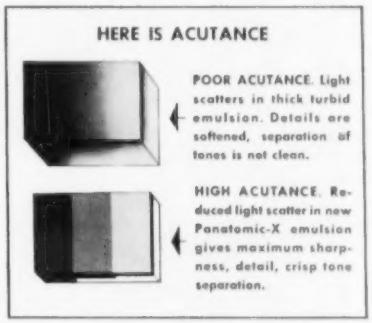


speed Kodak Tri-X Film, the new faster Plus-X, and high-speed Ektachrome. And from two more new developments—

1. An emulsion with less "light scatter" between the silver crystals.

2. A new wide-range *ultra-thin* emulsion—50 percent thinner than micro-grain films already on the market!

These two factors add up to superior *acutance* (see box)—they assure you the utmost in image sharpness, fine detail,



and crisp tone separation. (Incidentally, a film can have high "resolving power" and fine grain, but if the acutance is poor, the picture detail will be mushy.)

High speed, wide tone range

Old-type ultra-thin emulsions suffer from too much contrast, poor tone scale, low exposure latitude, low speed. But the new Panatomic-X has a curve similar to Tri-X (see box)—which means better exposure latitude, wide tone scale with no blocked highlights or blank shadows, and improved operating speed.

The Panatomic-X exposure indexes are 25 daylight, 20 tungsten. These, however, include the usual safety factor to insure full normal exposure. Finer grain is obtained with a correct minimum exposure that just retains shadow detail. This means that with correctly adjusted equipment, you can adopt a daylight index of 50. Workers who prefer thinner negatives for rapid enlarging may choose to adopt an index even higher, with some sacrifice of shadow detail.

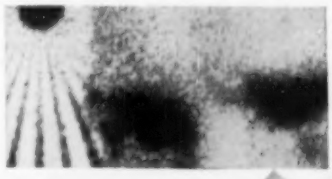
High-speed processing

The new roll-film Panatomic-X develops in 7 minutes in Kodak D-76; the 35mm, 7 minutes in D-76 diluted 1-to-1. We then recommend 1 to 2 minutes in Kodak Rapid Liquid Fixer, 2 minutes in Kodak Hypo Clearing Agent, 5 minutes in running water, and 15-to-30-minute drying in a current of warm air . . . *and you're ready to start printing.*

For line work, documentary copies, and the like, you can give longer, stronger development and get very high contrast. Special fine-grain developers are not needed with this micro-grain film, and we recommend that you do not use them.

In all Kodak Tri-X Film sizes

Your Kodak dealer now has—or soon will have—the new Panatomic-X in 35mm and all Kodak Tri-X roll-film sizes, Nos. 120, 620, 127, 135, and 828. Together, these two Kodak films give you a range from the finest image texture and sharpness to the maximum speed for tough light-and-action situations. Put them both to work for you—*now.*



100× photomicrograph of 35mm negative on Panatomic-X (see next page)

Kodak
TRADEMARK

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

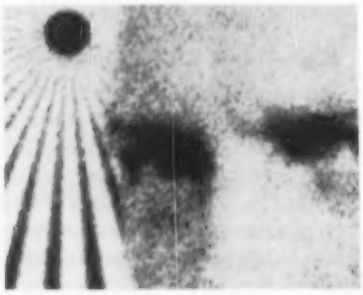
The Kodak BULLETIN

Triple f/1.9 "8" for

—plus our search, with camera and microscope, for some film grain in the new Kodak Panatomic-X Film . . . a new dynamic thimbleful of B-C flash for $9.95 . . . the $33.75 f/3.5 miniature that got crowded off the back cover . . . a clip-on illuminator for your $1.95 Kodak Pocket Viewer . . . and a swell color-print team.

Micro-fine film

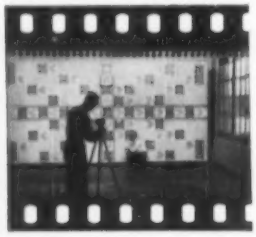
This month (see preceding page) we're glowing with pride about our new Panatomic-X Film. Here's a 100× enlargement from a section of film about the size of a gnat's eyebrow. It helps show what this new micro-grain, high-acutance film can do:



Naturally, to make the test as stiff as possible, we shot the negative with a Kodak Ektar Lens (on a Signet 35 Camera).* Then we had one of our experts make the enlargement through a microscope. It proves Panatomic-X *does* have printable grain if you blow it up far enough—with a microscope.

Seems to us this new film is one more good reason why you should start using a Kodak Ektar Lens—on a Signet 35 or Kodak Chevron Camera. Panatomic-X is a great film; why waste its sharpness? Use an Ektar, and let your Panatomic-X really work for a living.

**This is the complete picture—the pie-chart wall of the "third-degree" room in the Quality Control Division where Kodak*



Signets and other cameras get a final checkup. (The Quality Control people are inspectors-general who do a critical follow-up on the regular production-line inspections.) Negative developed in D-76, 1-to-1, 7 minutes. A 100× print would be over 8 by 12 feet. We blew up a middle-tone area where grain shows up most; the microscope resolves the grain more sharply than an enlarger is able to.

All this and f/1.9 too

Why beat around the bush? For $79.50 we want to sell you an 8mm movie camera with an *f*/1.9 lens . . . and wide angle and telephoto, to boot! All *f*/1.9!

The camera is the famous Brownie Movie Camera, redesigned with a three-

eyed turret and renamed the Brownie Movie Camera, Turret *f*/1.9. The standard lens is a color-corrected 13mm *f*/1.9 mounted "inside" the camera. For telephoto shots, you swing the telephoto barrel into shooting position and you've centered the telephoto converter lens in front of the standard lens. You're now getting the 2× magnification and speed of a 24mm *f*/1.9 telephoto. For the breadth and speed of an *f*/1.9 wide-angle lens, you swing the wide-angle converter into position. Neatest trick of the season!

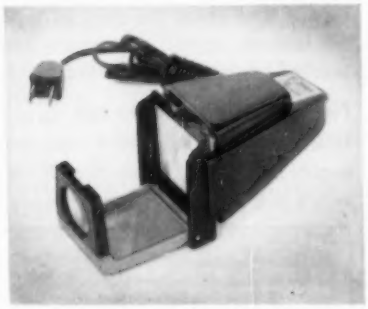
And there's more! The front finder has three etched color-coded rectangles that show the field of view for each lens. On each lens barrel is a scale that shows you minimum in-focus distance for each lens aperture from *f*/1.9 to *f*/16. (Images are sharp from the minimum distance to infinity at every aperture; no need to focus.) For parallax correction the rear finder is adjustable to show the field being covered from 3 feet to infinity.

If you're thinking of an 8mm movie camera for yourself or your family, this is it. If you want to see an ingenious design, this is it. Your Kodak dealer has the new Brownie Movie Camera, Turret *f*/1.9, in stock. And he'll confirm the price, $79.50, complete with lenses and nothing else to buy!

Flexible viewer

It's hard to beat a Kodaslide Pocket Viewer for handiness and compactness. Fold it up, slip it in your pocket—it takes about as much space as a couple of matchbooks. Hold it up to any convenient light for slide viewing, anywhere. Only $1.95.

However, not all viewing lights are exactly what you'd like. For critical viewing, editing, sorting a number of slides at home, it's better to have a made-for-the-purpose illuminator. We've got one —the new Kodak Illuminator, Model I —only $2.95—and made to slip right on the end of the Pocket Viewer (see cut). It comes complete with 7-watt bulb and



8-foot power cord, for 105-to-125-volt AC or DC. Smart and streamlined, it also makes a handy handle for holding the viewer. Take a look, at your Kodak dealer's.

V for TV

Shiny prints are a nuisance in front of a TV camera, which is why our soft-textured full-matte Kodak Opal Paper V is making a name for itself on the airwaves. We call this sheenless surface "suede," and it's the surface to grab when you are trying to print a soft, atmospheric scenic . . . or a very delicate

a mere $79.50!

portrait . . . or any other delicate short-scale subject in which paper sheen would be a bother. There's almost no specular reflection at all.

Brief

▶ It isn't that we're against things. It's just that fog, foam and calcium can cause trouble, and so we thought we ought to do something about it. We did.

One or two drops of Kodak Anti-Foam in your solutions will prevent any foam from causing spots and stains on film or paper emulsions. 10 oz. bottle, 51¢.

▶ A little Kodak Anti-Calcium prevents or minimizes the formation of hard water calcium precipitates in all developers except the caustic types. 90¢ a pound.

One Kodak Anti-Fog No. 1 tablet added to film or paper developer will suppress fog and increase contrast. It's wonderful for film and paper that has been stored too long or in too much heat, or requires forced development, or when there has been a long time between exposure and development. Bottle of 50 tablets, 94¢.

Very small scenes

Tired of scenics? Try the other extreme —with a microscope. Movie or still. If you don't own a microscope, borrow one. The world of the ultra-small is a fascinating place to explore. For photomicrography with a still camera, get the Kodak Data Book, "Photography through the Microscope," from your Kodak dealer. A supplementary booklet on motion pictures through the microscope can be had on request to our Sales Service Division.

Good color team

There's a new 32-page, 35-cent booklet, "Kodak Ektachrome Film," which rounds up a passel of useful facts on this modern high-speed transparency film and its use in daylight and with direct and indirect flash. There's also a new 75-cent revision of the "Kodak Flexichrome Process" book.

You should have both—because Flexichrome and the new Ektachrome make a natural team. Especially for anyone who likes to do his own processing and enlarging without a lot of fuss or special lab controls. You shoot, say, a 2¼ x 3¼, 2¼-square, or 35mm Ektachrome transparency . . . make a good black-and-white negative from it . . . make a black-and-white Flexichrome print, up to salon size if you choose. Then you use the Ektachrome transparency for a color guide as you convert the Flexichrome to full color. And you *adapt* the colors to

suit your fancy—for Flexichrome is a free-wheeling process that gives your artistry free rein. Costs less than you might think, too.

Get these two books—they'll open up some refreshing new vistas for you.

Muscular midget

Here's a sweetheart of a midget B-C flash unit for only $9.95. It's the new Kodalite Super-M—neat, compact, but a powerful handful.

Flash units took a long time to get down to the size where they *look* right

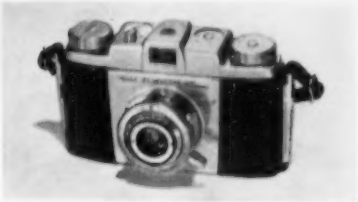
and *feel* right on a hand camera. This is one you'll really like. Uses up practically no space in your gadget bag. It takes either M-2 or No. 5 or 25 or 8 lamps . . . uses a B-C circuit for maximum dependability . . . uses the new small 15-volt photoflash batteries . . . has a bracket that fits it to most cameras (you can also get it with a special bracket for Kodak Retina IIc and IIIc Cameras, same price). Its neat 5-inch cord has interchangeable connectors for ASA bayonet *and* European-type flashposts.

The reflector, of course, is a tough, non-denting, Kodak Lumaclad reflector —with the vacuum-deposited mirror-bright surface that gives you 50 percent more efficiency than old-type reflectors. Only 3 inches across, this reflector is shaped to squeeze every possible lumen out of your extra-midget bulbs. For convenience, there's a sliding flash calculator on the back of the battery case.

The smartly functional case fits the hand comfortably, and has a chrome front and Kodadur-covered sides. The reflector is detachable. Two color choices: a *black* model, to go with your Kodak Signet or other black-and-metal cameras, and a *brown* model to match a Kodak Bantam RF, or Kodak Pony 135, Model C, or Kodak Stereo Camera.

Back-cover addenda

There's just so much room on the back cover of a magazine and no more. So,



we had to leave out a new version of a camera that shouldn't be left out.

It's the Kodak Pony 135 Camera, Model C, one of the sweetest budget-priced miniatures that has come up in a long time. It's made to order for the man who wants a low-priced camera with a fast lens or a second miniature for black-and-white work. Here's a quick run down on the Model C: Kodak Anaston Lens, *f*/3.5, 44mm. Focuses to 2½ feet. 1/300 shutter, body release, film-type indicator, depth-of-field scale, automatic metering, exposure counter, no-thread loading, and a price that makes it today's best buy in the miniature field. The Kodak Pony 135, Model C, is $33.75 at your Kodak dealer's.

Prices include Federal Tax where applicable and are subject to change without notice.

Kodak

EASTMAN KODAK COMPANY, Rochester 4, N. Y.

New Color Films and Flash

on the "M" synchronization setting and the electronic flash shots at 1/250 second on the "X" setting. All the test films were processed by the same commercial color lab.

The daylight Anscochrome instructions gave a guide number of 95 for a single 5B photoflash lamp and 42 for my 100-watt-second electronic flash unit; the daylight Ektachrome, 88 for 5B flashbulbs—but no figure for electronic flash. Estimating a possible speed loss in E-2 Ektachrome due to differences in reciprocity-failure characteristics, I started with the same electronic-flash guide number that I had been using for the old-type E-1 Ektachrome roll film—40. In the case of E-2 Ektachrome Type F, the listed guide number for the clear No. 5 flashbulb was 110.

In making my test exposures, I used a fixed lighting setup consisting of a key light placed five feet from the subject, a backlight at the same distance, and a fill-in ten feet from the model on the shadow side. Neither the backlight nor fill-in had any bearing on the actual exposure. Although the camera position and the model's pose were changed between the three series of exposures, the lamp-to-subject distances remained constant throughout.

Before we compare color quality, it is interesting to note that the two daylight-type films tested seem to have a rather wide exposure latitude when exposed to blue-flashbulb illumination. In both cases, all three of my bracketed exposures—the normal, normal minus half a stop, and normal plus half a stop—produced "acceptable" exposures. From a comparative standpoint the Anscochrome guide number was slightly high and the Ektachrome slightly low. Incidentally, transparencies which many of us consider perfect for viewing purposes frequently wash out when reproduced in color on the printed page. Most engravers find they get their best results from transparencies which are about half a stop underexposed by viewing standards and which retain unblocked shadow detail.

In the case of my electronic flash exposures, however, exposure latitude seemed to narrow down appreciably—possibly the result of reciprocity failure. There was only one "best" exposure with each of the two daylight-type films—a guide number of 50 producing the desired result with Anscochrome and 35 with E-2 Ektachrome.

Since color evaluation is necessarily based upon personal taste as well as prior experience, it is possible that some users of the new, fast color films may disagree violently with the judgments expressed in this article. My opinions are conditioned by the fact that almost all of my color photography is shot with an eye for the best possible reproduction in the magazines from which I receive assignments.

Blue flashbulbs with the two daylight-type films

When exposed by the light of blue flashbulbs, both E-2 Ektachrome and Anscochrome tended to produce an image with a warm, yellowish over-all hue which was particularly apparent in the flesh tones.

(*Continued from page* 61)

While this effect may seem rich and lush to the casual observer, many a practiced eye will consider it objectionable. Another general observation: the Anscochrome film seems to have substantially softer gradation than Ektachrome. With Anscochrome, shadow areas are completely transparent, whereas Ektachrome shadows are blacker and tend to block up, losing essential detail.

From the standpoint of color fidelity, on the other hand, my Ektachrome results were substantially better than Anscochrome. The latter transparencies ran toward an over-all magenta hue which made the blues purplish, the yellows greenish, and the reds considerably duller than the original subject matter. The Ektachrome's blues were remarkably similar to the original colors, as were the yellows and reds as well as the gray rug. Moreover, the general impression was far more brilliant in the case of Ektachrome. Despite these differences in gradation and color rendition, the results I obtained with both films were quite acceptable for direct viewing and projection, as well as publication.

Electronic flash with the two daylight-type films

Here again, a general magenta overcast in the Anscochrome transparencies detracted from what might have been an excellent result—even though the Ansco UV-15 filter recommended for this type of lighting was used in front of the camera lens. The purple highlights on the face and hair were even more pronounced than they were with the blue flashbulb exposures. The gray rug too went purple. Although the yellow flesh tones were not evident as in the blue flashbulb exposures, the skin tones had a noticeable reddish hue. By contrast, the Ektachrome did an excellent job of reproducing the color and brilliance of the red pillow, the yellow skirt, and particularly the model's sunburnt complexion. Again, the Anscochrome produced softer gradation and better shadow detail, and again both results would be acceptable for all purposes.

Clear flashbulbs with Ektachrome Type F

These results were obviously the best of all. There is no disputing the fact that the brilliance and color fidelity of the No. 5 flashbulb exposures on this new-type emulsion, which was specifically balanced for clear-flashbulb illumination, surpassed the various results we obtained with daylight-type color films and "daylight blue" illuminants. If any fault can be found with this combination, it would be in the matter of contrast. The Type F emulsion is a bit softer than Daylight Type E-2 Ektachrome, yet there is an apparent loss of shadow detail and a slight tendency for shadows to go black instead of retaining their original hues as in the case of Daylight Type Anscochrome.

Conclusion

When you are obliged to shoot flash exposures indoors, there is no question that your best results will be produced with clear flashbulbs and Type F Ektachrome film—except when you have to contend with daylight pouring into the room through uncurtained or unshuttered windows. In the latter eventuality, blue flashbulbs or electronic flash with either of the two daylight-type color films will be required to effect a balance with the color quality of the prevailing daylight. Additionally, when the action-stopping power of electronic flash is needed, one of the two daylight-type color films will be preferred to the Type F film.

(Since this project was begun, the future availability of a Type F Anscochrome film was announced, but samples of the new material were not available for inclusion in our tests.)

Our observations can safely be used as a guide to your flash work with the new fast color films. It should, in no case, be used as the basis of hard-and-fast rules. Processing can vary from one commercial color-finishing laboratory to another and the various film emulsions tested may be changed or substantially improved as further experiences are reported to the respective manufacturers.

Take heed of our procedures, and results, and now you're on your own!—▶

Speedlight Studio

(*Continued from page* 63)

four-lamp, four-pack speedlight outfit that Halsman brought with him made its appearance on the market, a few months after his return, as the Ascorlight Model AA-601—with certain modifications whose necessity had been indicated by the field test.

The Halsmans' voyage (Mrs. Halsman almost always participates in Philippe's studio ventures) wasn't quite a matter of carrying coals to Newcastle. There are many skilled portrait men in Great Britain and on the continent. But those who have had any experience shooting the 4x5 and 5x7-inch transparencies that are preferred by the *Picture Post* engravers are few indeed. As for matching Halsman's skill with large-format color materials, there was just no one in Europe who qualified in the eyes of *Picture Post's* editors.

From almost every conceivable standpoint, Halsman's trip was an unqualified success. In England, he shot Anthony Eden (one of the few black-and-whites in the series became the Prime Minister's official campaign photograph); the head of the Foreign Office, Macmillan; the Chancellor of the Exchequer, Butler; Lord and Countess Mountbatten; the leaders of the opposition, Bevan and Gaiteskell; a dozen actresses including Claire Bloom, Mai Zetterling, and Ludmilla Tcherina; the dancer Beriosova, and others. In France, Pierre Mendes France, the Abbe Pierre, the painter Chagall, the actor-playwright Ustinof, the Aga Khans and the actresses, Olivia de Havilland, Odile Versois, Marina Vlady and Brigitte Bardot all sat for Halsman's cameras. In Italy, on the last leg of the tour, Audrey Hepburn, Sophia Loren, Constance Smith, and Mel Ferrer were famous subjects.

Since the sittings first began in mid-March 1955, many of these portraits have appeared as covers on *Life* as well as *Picture Post* (the Eden portrait made both by mutual agreement); some too

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have made spectacular inside-the-book color spreads, both in these two famous picture weeklies as well as in less prominent publications throughout the world.

How did he do it? Most of the political persons were photographed at their homes or in their offices with a very minimum of his portable lighting equipment. In England, Halsman photographed most of the entertainment celebrities in the studio of a large newspaper; in France and Italy he succeeded completely in avoiding the need for studios. Mrs. Halsman assisted him everywhere—with the aid of a *Picture Post* helper in England and alone in the two other countries they visited.

His cameras were a 5x7 Graflex and the unique 4x5-inch Fairchild-Halsman twin-lens reflex camera, of which only three exist today. A bare 10 percent of the shooting was in black-and-white—on Kodak Super Panchro-Press Type B; the rest was done on sheet Ektachrome. The flexible speedlight equipment he used throughout was invariably arranged so that full-figure poses were shot at *f*/11; close-ups at *f*/16 or *f*/22. Most of the studies were managed with Halsman's basic 4-lamp portrait setup—mainlight, fill-in, background light, and hair light.

What about the speedlight units themselves? What made them so suitable for this overseas project?

When Halsman had described the units he dreamed about to Harry Parker, president of the American Speedlight Corp., he had specified: light weight, compactness, portability, and flexibility. As to light output, he explained that the units should be strong enough to permit shooting of full figures at *f*/11 on slow Ektachrome. On the other hand, they should not be too strong to make close-ups impossible when using a Rollei, which can not be stopped down beyond *f*/22. When Ascor Sunlight units that Halsman uses in his New York studio operate at high voltage with oil-filled capacitors requiring heavy connecting cords and massive powerpacks. The new Ascor 600 series, on the other hand, is based on 900-volt operation with relatively light-weight electrolytic capacitors and other components. Additionally, the 10-inch reflectors were designed to nest, one within another, reducing appreciably the over-all bulk of the packed equipment. A single complete AA-601 unit, less light stands, weighed but 17½ pounds and provided a guide number of 85 with the older type E-1 Ektachrome which Halsman used.

What pleased Halsman more than any other factor was the availability of four lamp outlets on each of the 500-watt-second powerpacks of the AA-601. He packed along four complete units on the trip. In normal studio use, he connected each lamp to its own powerpack. On side trips to the homes and offices of his busier subjects, he sometimes took along only one or two power pack units, since less light was needed; his four lamps were connected to either or both of the packs depending upon how he wished to split the available light output between the lamps. The availability of four identical power supplies, each with four separate outlets, represented a very important operating

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safety factor. Just in case of any trouble with a power supply, he was always able to use his basic four-lamp setup with the remaining packs and to adjust the lens aperture for the reduced light.

In offering Halsman a set of preproduction models of the AA-601 unit, the American Speedlight Corporation frankly expected to determine what modifications would have to be made in their basic design to make the equipment meet the severest demands of the exacting field worker. Halsman did not fail them.

In the first place, the reflectors had to be refitted with bayonet-type connectors and the swivel of the L-shaped stand mounting equipped with a positive lock so that the weight of Halsman's manually-shaped aluminum-foil snoots could be supported. The lamp sockets, originally finished with aluminum paint to produce maximum reflectivity, tended to smoke and burn from the modeling lamp heat in the pretrip exposure tests. These were immediately changed back to the original brown finish of the plastic material, which cost 15 percent of the anticipated reflectivity. Preproduction tests with the AA-601 speedlight also produced a much bluer flesh tone on Ektachrome film than Halsman had been getting with the non-portable speedlights he had been using in his studio during the past many years. The aluminum finish on the Ascor reflectors was immediately reformulated to neutralize the bluish hue.

A lesser but in no way less practical modification was called for in the power-pack handles which were originally mounted across the short dimension of the housing. This made for clumsy handling, and on Halsman's return from the trip, the handles were remounted longitudinally.

While Halsman was away in Europe, there was an interesting change in the basic design of the AA-601 lamp head. When he had originally presented his requirements to Ascor, the manufacturer was already working on trying to obtain a high light output, low-voltage tube that would make possible the type of portable equipment envisioned by Halsman. Since no successful flashtube meeting his specifications had as yet been designed, the AA-601 was originally built with four 200-watt-second flashtubes clustered around a single modeling light. This is what Halsman took along on his trip. During the trip, the high-output low-voltage flashtube became available and the design of the lights was immediately changed to a single flashtube with three modeling lights clustered around it. This resulted in improved efficiency, compactness, and operational ease. It also makes up for the previously mentioned loss of reflectivity arising from the use of the non-reflecting lamp socket.

Returning to our original premise, Halsman's European journey was an unqualified success. It produced a portfolio of exquisite portraits that are now making the rounds of the world's leading publications through the syndication facilities of the Magnum picture agency; the editors of *Picture Post* achieved their heart's desire, and a splendid new speedlight unit was perfected.—

Transporting Pictures

(*Continued from page* 22)

But, at the same time, it still doesn't settle the problem of determining what is and what is not obscene.

Nor is there any satisfactory explanation as to why two copies of the picture should spell out a presumption of intention to sell or distribute the picture. And would one roll of exposed film be interpreted as one item or would each exposure be counted?

Therefore, if you haven't gone through the papers in your wallet, your car, or your traveling case in a long time, you ought to do so before your next trip across any state line. Or else you might have a Federal case on your hands.

The authors of the legal column regret that each specific question submitted by readers cannot be answered directly in the column. The questions are used, however, as the basis for columns on a particular subject and, wherever possible, the authors do send a reply directly to the reader. Because your letters help them to decide what subjects you wish to have covered in the column, the authors invite your questions and your suggestions on the contents of future articles.

35-mm Today

(*Continued from page* 30)

improve anyone's processing. By far the best developing tanks (*this columnist's personal opinion*) are the stainless-steel Nikor brand (no relation to any *camera* manufacturer) which are made in a variety of heights to handle from one to a dozen 35-mm reels simultaneously. With this equipment it is possible to develop an entire exposure series together, thus eliminating any minor variations in processing conditions. The Nikor reels are made of long, spirally wound stainless-steel rods, and are loaded very easily from the center outward.

One last word on processing controls: *forget about development by inspection.* The faintest veil of safelight fog or aerial oxidation can seriously affect the accuracy of test developments. And if the film is inspected you can never be sure that this exposure to the green safe light did not influence your results.

Now, these five sets of controls—subject, lighting, exposure meter, camera and processing—may sound overly complicated, fussy, and unnecessary to some. To the sensitometrist who exposes his film in costly sensitometers to obtain density wedges which he develops in fantastic machines which swab developer back and forth over the film with camel's hair brushes, they must appear crude and monstrously unscientific.

In my opinion they are neither overly careful nor unduly careless. They constitute, I believe, a working compromise between theoretical and practical photography.

Next month we will conclude this series and discuss some aspects of setting up useful tests and analyzing the results.

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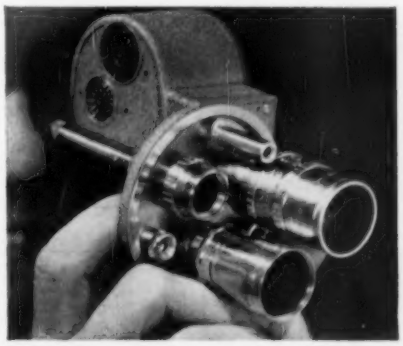

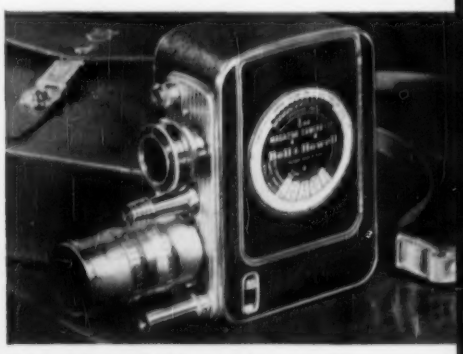

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ALTHOUGH THE AVERAGE "serious" photographer does his own enlarging, usually he doesn't think of it as a skill that can be used to increase his income. Actually, however, it's a phase of photography that can be developed into a lucrative spare-time business.

It is assumed that you know your photography and that you require only some professional advice and guidance to help you get started—if you can make good enlargements for yourself you can do the same for others. The equipment you are using at present (enlarger, trays, and other items) may not be elaborate, but it should serve adequately at the start. Later, as your volume of work increases, you may require some additional pieces of equipment to help you to work more quickly and efficiently.

The market for custom enlargements is practically unlimited. You can do work for amateurs who do not make their own enlargements, but who want something better than run-of-the-mill jobs which are turned out in quantity—or for those who don't have enough experience to produce the kind of enlargements they want. And you should be able to do work for professionals, too. Many studios and free-lance photographers are hampered by delays in production that frequently originate in the printing room, especially during rush periods when time is at a premium. Therefore, many professionals are glad to know someone who can do good enlarging jobs for them when they're pressed for time.

You'll need samples of your work, so make up about a dozen 11x14 enlargements on 16x20 standard mounts. Vary your subjects—have some portraits of men, women, children, and pictures of landscapes, pets, interiors, close-ups, and so on. Have business cards printed with your name, address, telephone number, and the statement that you do photographic custom enlarging.

Visit your local photographic supply shop, tell the proprietor about your

cropping

1 Straight enlargement of a 35-mm shot, made by routine commercial photofinishing method, is exact but uninspiring print of entire negative.

2 Custom type enlargement shows same negative printed in reverse, effectively cropped.

toning

By LLOYD WEST

1 A light print of this peaceful scene would lend itself well to reddish-brown selenium toning for heightened sunset effect.

2 Darker print of same negative looks like moonlighted night scene, which could be enhanced and deepened by blue toning.

work, and offer the standard discount on all work the shop can get for you. Also, you should make a price list—bearing in mind that you are not competing for the kind of work that can be produced in quantity and at a comparatively low price, but that you can and should charge for enlargements according to the time and effort expended on them as well as for superior work. Your list will vary, necessarily, in proportion to the time, work and supplies used for each individual job, but you can arrive at an average which should be your basic charge. Figure out the worth of your time per hour, and be sure that you have at least that much left over after all overhead and other expenses are deducted. Extra charges are made for vignetting, border printing, toning, and other special services.

It is inadvisable to have your price list printed, at least for a while, as changes probably will have to be made as you proceed. For the first couple of months, until you are established, you may find it necessary to make income a secondary consideration—that is, until you have proved to your customers that your work is of high standard and completely satisfactory. However, don't make the mistake of setting your prices too low—you should take pride in your work, and don't forget that it is necessary that you make a profit or you cannot remain in business.

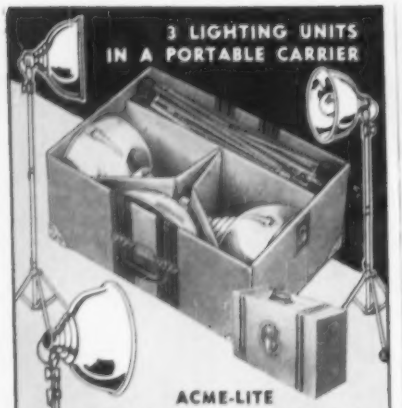
You can also make a specialty of "master enlargements"—outstanding prints, to the making of which you devote special effort. For these you should accept only very good negatives, since the results must be really exceptional and which are charged for, accordingly. Inferior results in any phase of your work are undesirable, of course, since you have a business reputation for good work to maintain.

If there is a camera club in your vicinity, make a point of visiting it as well as other clubs and organizations which may be (*Continued on next page*)

backgrounds

1 Distracting background in this straight-print enlargement is confusing, detracts from good picture.

2 Opaquing on negative eliminated the undesirable background, resulted in attractive, clear-cut print.



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interested in your type of work. It's a good idea to ask that a notice concerning your photographic enlarging service be posted on their respective bulletin boards.

When you call on the professional photographers, you may find some who will want samples of special work. In these instances, you might offer to make a couple of such samples, without charge. If you do this, make sure to find out exactly what their individual requirements are, the kind of paper they use in their own work, the degree of diffusion employed, and other details. Note their displays in studio and show window, to be certain of what they consider good prints—ideas on this subject can differ widely. And in making special samples for professionals, you should be sure to supply exactly what is requested, without argument or suggestion of any kind. In dealing with amateurs, you'll find that frequently they will ask for and will welcome sound advice, tactfully given. But in dealing with professionals, remember that every professional has his own ideas and methods.

After you have contacted every possible source of work, your original samples can be used for publicity as follows: paste one of your business cards on the mount of each sample, then distribute the pictures for display in local shop windows and similar places where people will see them. Many shopkeepers are willing to display an attractive photograph because of its eye-stopping value—people pausing to look at the picture will look at the merchandise exhibited, also.

Attention to every detail, no matter how small, is important. Here are some points to note: probably you will have to start by calling for and delivering your work, so it's smart to plan a route that can be covered most quickly, and make your visits only once a week. Quality work takes time, as you can explain to your customers, and you should not do any rush jobs unless you receive additional payment for them. Concentrate on doing the best possible work, and make your deliveries promptly. Don't let anyone take advantage of you and don't lower your prices or make a habit of extra pick-ups or deliveries. And don't do free work for relatives or friends—your time is your most important asset. If you do any work gratis you cannot give sufficient time to your business.

You can add to your knowledge by studying books and magazine articles on enlarging and related techniques—you'll find them helpful in supplying you with special pointers and news of processes, as well as other details . . . for example, see the following: *Lessons in Cropping* (PHOTOGRAPHY, April 1954); *Toning for Portraits* (PHOTOGRAPHY, March 1954); *Basic Enlarging* (PHOTOGRAPHY, October 1954), and *Advanced Enlarging* (PHOTOGRAPHY, December 1954).

According to available statistics, the number of establishments that can produce quality enlargements amounts to a mere handful in ratio to the many millions of camera owners in the United States, so there is a vast potential market for this type of work, which should prove a profitable way of utilizing your spare time.—

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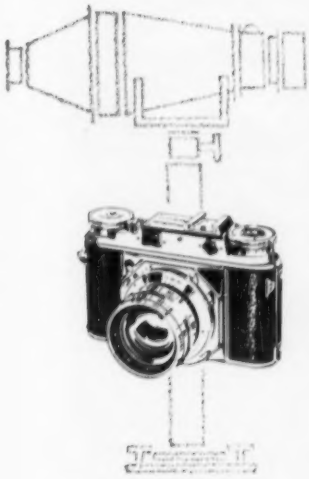

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WHICH

This chart will help you

Flash Bulbs For Use With Simple Cameras*

LAMP	BASE	APPROX. RANGE°/	REMARKS
M-2	Pinless	4- 8 ft	
PF 2-M	Pinless	5-10 ft	
PF 2	Bayonet	5-10 ft	
Bantam 8	Bayonet	5-10 ft	
8	Bayonet	5-10 ft	
PF 3	Bayonet	6-12 ft	
5	Bayonet	7-15 ft	
25	Bayonet	7-15 ft	
PF 4	Bayonet	7-15 ft	
0	Medium	7-15 ft	
11	Medium	8-18 ft	
40	Medium	8-18 ft	
SM	Bayonet	4- 8 ft	
SF	Bayonet	4- 8 ft	

*/Range based on aperture of f/16 divided into guide No. and polished reflectors. For matte reflectors divide distances by ½.

* Consult Camera manufacturer for data on which lamps synchronize properly with your camera.

° Simple camera shutters vary considerably. Use these as a rough guide only.

Flashbulbs For Use With Between-lens Shutters (Class M)

LAMP	BASE	GUIDE NO. @ 1/25	REMARKS
PF 2	Bayonet	105	
PF 3	Bayonet	120	
8	Bayonet	100	
Bantam 8	Bayonet	95	
PF 4	Bayonet	180	
5	Bayonet	140	
PR-25	Bayonet	160	
0	Medium	140	
11	Medium	170	
PR 40	Medium	170	
22	Medium	200	
2	Medium	240	
			Class F**
SM	Bayonet	80	Low output • closeups
SF	Bayonet	80	Low output • closeups
			** Guide No.'s apply to speeds up to 1/100. Place synchro lever on shutter at "X" or "F."
			Ultra Miniature

Flashbulbs For Use With Focal-Plane Shutters (Class FP)

LAMP	BASE	GUIDE NO. @ 1/100	REMARKS
6	Bayonet	65	For small focal-plane shutters up to 2¼x3¼.
FP-26	Bayonet	90	
31	Medium	90	For large focal-plane shutters—3¼x4¼ and 4x5
FP-2A	Medium	80	

FLASHBULB?

choose the right bulb

Blue Flashbulbs

LAMP	BASE	GUIDE NO. @ 1/25 † +	REMARKS
5B	Bayonet	55	
25B	Bayonet	55	
6B	Bayonet	55	For focal-plane shutters
FP-26B	Bayonet	50	up to 2¼x3¼.
11B	Medium	65	
40B	Medium	65	
22B	Medium	75	
2B	Medium	90	
31B	Medium	80	Use with large focal-plane shutters-(3¼x4¼ and 4x5)
50B	Medium	110‡	SYNCHRONIZE at 1/25
3B	Medium	120‡	second ONLY.

The above flashbulbs are for use with daylight-type color films.

+ For polished reflectors. For satin reflectors give ½ stop extra exposure.

† For Daylight Kodachrome. For fast color films (Ektachrome, Anscochrome, Kodacolor) give 1½ stops less exposure.

‡ In studio-type reflector.

Amber Flashbulbs§

LAMP	BASE	GUIDE NO. @ 1/25	REMARKS
5A	Bayonet	85	
6A	Bayonet	50	For small focal-plane shutters up to 2¼x3¼
11A	Medium	105	
22A	Medium	145	
50A	Medium	170	Synchronize at 1/25 ONLY with regular equipment.
25C	Bayonet	95	

All of above flashbulbs are for use with Type A Kodachrome and require no filters.

§ Do not use with Ektachrome or Kodachrome Type F or 35 mm and Roll Anscochrome artificial light (flash) type.

§§ Also give pleasing color with 3200 K color films such as Ektachrome B and Anscochrome Tungsten.

Infrared Flashbulbs

LAMP	BASE	††Guide NO. @ 1/25	REMARKS
5R	Bayonet	65	Black-out flash, medical, scientific, and criminological photography.
11R	Medium	90	Greater "light" output than 5R
22R	Medium	110	Maximum output

All of above flashbulbs are for use with infrared film only.

Kodak supplies Infrared film in 36-Exp 35 mm cartridges, in 100 ft 35 rolls (also available from Du Pont), and in standard sheet-film sizes.

Gevaert will supply 120, 620 (and possibly other) roll Infrared film on special order. 5-week delivery.

†† For polished reflectors. Give ½ stop extra exposure for satin reflectors.

For Maximum Light Output (Class S)

LAMP	BASE	GUIDE NO. @ 1/25	REMARKS
50	Medium	300	In studio reflector ‡‡
3	Medium	320	In studio reflector ‡‡

‡‡ These lamps synchronize at 1/25 sec only with regular equipment.

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PORTABLE SPEEDLIGHTS TODAY

This chart was made possible by the speedlight manufacturers and distributors who were kind enough to cooperate with our recent market survey. All data is as supplied by the manufacturers and distributors.

Model Name and/or Number	Manufacturer or Distributor	Electrical Energy Input in Watt-seconds	Guide Number for Daylight Kodachrome[1]	Color Temperature[2]	Flash Duration[4]	Weight of Unit[5]	Recycle Time with A-C Operation[6]	Weight of Unit with Rechargeable Storage-Battery Operation	Recycle Time with Storage-Battery Operation[7]	Number of Flashes from One Storage-Battery Charge[8]	Weight of Unit with Dry-Battery Operation	Recycle Time with Dry-Battery Operation[9]	Shelf and Shot Life of Expendable Dry-Battery[10]	Cost of Replacement of Dry Cells[11]	Additional Data and Remarks[12]	Cost of Basic Unit[13]
Ascorlight BA 201 Series 200	American Speedlight Corp.	75	45	6,500	1/1330						4 lb. 4 oz	4 sec	9 months 1,000 flashes	$15.95	*Thyratron vacuum-tube triggering minimizes electrical current in shutter contacts.*	$89.50
Ascorlight BA 203 Press Unit	American Speedlight Corp.	75	45	6,500	1/1330						4 lb, 8 oz	4 sec	9 months 1,000 flashes	$16.20	*Thyratron trigger tube. Unit with synch solenoids as well as internal "X" circuit. Entire unit mounts to body of 4x5 press camera.*	$120.00
Ascorlight BA 204 Series 200	American Speedlight Corp.	75	45	6,500	1/1330			3 lb 14 oz	6 sec	500			1 year		*Thyratron trigger tube. Nickel-cadmium rechargeable battery interchangeable with "D" cell dry-battery pack.*	$127.50
Ascorlight AA-302 Home Portraiture	American Speedlight Corp.	150	72/24 per light	6,500	1/1500	6 lb, 8 oz	5 sec								*Thyratron trigger tube.*	$335.00
Ascorlight AA-405	American Speedlight Corp.	200	75	6,500	1/2500		8 sec	10 lb	8 sec	300					*Thyratron trigger tube. Built-in a-c and charger unit. Nickel-cadmium battery pack. Will accept up to 6 extension units.*	$289.00
Ascorlight AA-501 Studio Portraiture	American Speedlight Corp.	200	70	6,500	1/2500	12 lb	5 sec								*Thyratron trigger tube. Built-in modeling lights. Three-position power control. Unit complete with stand on caster base.*	$345.00
Astra Speedlight No. 230	Sterling-Howard Corp.		65	6,500	1/2000	18 lb	5 sec								*Extra socket for two flash-reflector use.*	$89.50
Beattie Electronic Flash Model 50	Photographic Products, Inc.	53	30	6,300	1/1000	4½ lb	5 sec									$94.50
Braun Hobby BH100	E. Leitz	105	30-56	5,600	1/1000	5½ lb	10 sec	5½ lb	9-10 sec	80	4½ lb	6 sec	1 year 750-1,000 flashes	$15.95	*Unit operates from high-voltage dry cell, wet storage battery or 110-125-160-220 volts a-c. Flash tube focuses within reflector for 50- or 70-degree beam. Neon ready-light. Manual discharge button.*	
Braun Hobby Standard	E. Leitz	60	30-35	5,600	1/1000		10-12 sec					15 sec	See Note Y	$ .80	*Unit operates from "D" cell pack, rechargeable wet cell or a-c 110-130 or 220-245 volts. Tube focuses within reflector for 50- or 70-degree beam. Neon ready-light. Manual discharge button.*	
FR Model 2	FR Corp.	50	50	7,000	1/500	2½ lb	6 sec				3¼ lb	10 sec	1 year 150-300 flashes	$ .80	*A-c unit built-in. Neon ready-light.*	
Harwood IV-X	Harwood Mfg. Co.	120	50-55	6,600	1/750	5 lb	7 sec				5 lb	5-10 sec	1 year 500 flashes	$15.30		$54.95
Harwood IV-XFM	Harwood Mfg. Co.	120	50-55	6,600	1/750	5 lb	7 sec					5-10 sec	1 year 500 flashes	$15.30	*Thyratron trigger circuit with adjustable zero to 20 milliseconds delay.*	$110.00
Harwood Econoflash IIIA	Harwood Mfg. Co.	53	30-35	6,800	1/1000	2 lb	3 sec								*Unit permits synchronization with solenoids.*	$120.00
Hico-Lite 109 Pro Deluxe	Hauman Instruments Co.	115	50 on high 35 on low	6,200	1/1000 on high 1/1500 on low	4½ lb	4 sec on high 2 sec on low				4¼ lb	4 sec on high 2 sec on low	6-9 months 1,000-2,000 flashes See Note Y	$15.90	*Neon ready-light. High-low switch reduces electrical energy input from 115 to 60 watt-seconds.*	$59.50
Hico-Lite 228 Pro Deluxe	Hauman Instruments Co.	230	75-80 on high 50 on low	6,200	1/500 on high 1/1000 on low	6¼ lb	6 sec on high 4 sec on low				6 lb	6 sec on high 4 sec on low	6-9 months 400-1,000 flashes See Note Y	$15.90	*Neon ready-light. High-low switch reduces electrical energy input from 230 to 115 watt-seconds.*	$124.50
Hini-300 Electronic Flash Kit	Illinois Condenser Co.	100	65	6,300	1/600	6¼ lb	7-10 sec				7½ lb	7-12 sec		$9.18		$194.50
Lightning-Lite Model AC-PC	Lightning-Lite Co.	240		6,500	1/15,000 1/30,000 optional	14 lb	7-10 sec									$39.50
Limelite 50	Limelite Corp.	100	60	5,800	1/750	4¼ lb	15-20 sec				4 lb, 2 oz	4-6 sec	6 months 1,000 flashes	$15.90	*Built-in photocell.*	$165.00
Medetron Model MA-1, MA-2	Photronic, Inc.	55	11	5,400	1/100	6½ lb	8 sec								*Specifically designed for close-up clinical color photography. Built-in focus light.*	$99.50
																$298.00

Medatron Model M-B	Photronic, Inc.	55	11	5,400	1/100	3½ lb	8 sec								*See above.*	$225.00
Megalume 1	Nems-Clark, Inc.	100	45	6,500	1/2500	7½ lb	7 sec	7½ lb	8 sec	125 (minimum)					*Built-in a-c and wet-battery charger.*	$167.95
Megalume 2	Nems-Clark, Inc.	200	68	6,500	1/1400	10¼ lb	6 sec	10¼ lb	7 sec	150 (minimum)					*A-c and wet-cell operation with built-in charger. Two-light operation.*	$275.00
Mighty-Light Nickel Cadmium Unit	Speedlight Center		30	6,200	1/1000	1 lb	5 sec	1½ lb		150						$76.95
Mighty-Light Flashlight Battery Unit	Speedlight Center		30	6,200	1/1000	1 lb	5 sec				1½ lb	10 sec	See Note Y	$ .80		$59.95
Mighty-Light A-C Unit	Speedlight Center		30	6,200	1/1000	2 lb	5 sec	1½ lb	3 sec	Varies with optional packs	1½ lb	10 sec	Varies with optional packs	$ .80 to $15.90	*"D" cell pack gives 150 flashes. Nickel-cadmium battery gives 150 flashes per charge. Pro dry pack gives 2000 flashes. Heavy-duty pack gives 7000 flashes.*	$44.95
Mighty-Light Deluxe A-C	Speedlight Center		40-45	6,200	1/1000	1 lb	8 sec	1½ lb	5 sec	1000	1½ lb	10 sec	3 months	$15.90		$59.95
Mighty-Light Deluxe Pro Dry Pack	Speedlight Center		40-45	6,200	1/1000	1 lb	8 sec	1½ lb	5 sec	1000	1 lb	5 sec	3 months	$15.90		$79.95
Minitron M Model 60	Radio Engineering Co.	60	35-40	6,500	1/600	27 oz	5 sec								*Vacuum-tube triggering circuit minimizes current in shutter.*	$69.95
Minitron Model 220	Radio Engineering Co.	230	80	6,500	1/250	6 lb	12 sec								*Vacuum-tube triggering circuit minimizes current in shutter. A self-contained a-c unit.*	$250.00
Life Time Flash Unit	United States Camera Corp.	30	30	6,500	1/750	1 lb, 5 oz	3 sec				BP III 4.5 lb BP IV 2.5 lb	BP III 4 sec BP IV 7-20 sec	BP III, 1 year, 2,500 flashes BP IV 3 mos, 300 flashes	BP III $6.80 BP IV $ .80	*Battery packs BP III and BP IV have neon ready-lights.*	$29.95
U.S.C. Lifetime Flash No. 6550	United States Camera Corp.	30	30	6,500	1/500	1¼ lb	5 sec				2¾ lb	BP III 5 sec BP IV up to 30 sec	BP III, 1 year, 2,500 flashes BP IV, 3 mos 300 flashes	BP III $6.80 BP IV $ .80	*See above.*	$29.95
Ray-O-Flash Model R	American Cinefoto Corp.	150	32	6,800	1/10,000	13 lb	7 sec									$165.00
Shaw-Lite Model 400 II	Shaw-Lite Electronic Corp.	60	40		1/1000			3 lb	2 sec	1000						$49.95
Shaw-Lite Model 600 II	Shaw-Lite Electronic Corp.	120	60		1/1000			3 lb	2 sec	1000						$59.95
Starliter	Scheibe Engineering, Inc.	200	60-70													$240.50
Stroboflash I	Graflex, Inc.	50	35	7,000	1/1400						3 lb, 2 oz	3-6 sec	9 months 1,000-1,500 flashes	$15.90	*Thyratron vacuum-tube triggering. Slave-unit operation with photocell. Head interchangeable with SR II and III power packs.*	$89.00
Stroboflash II	Graflex, Inc.	100	50	7,000	1/1000						7 lb, 8 oz	3-6 sec	6 months 2,000 flashes	$19.90	*Same as above, except head interchangeable with SR I and III power packs.*	$115.00
Stroboflash III	Graflex, Inc.	200	70	7,000	1/500						9 lb, 4 oz	6-10 sec	6 months 1,000 flashes	$19.90	*Thyratron vacuum-tube triggering. Slave-unit operation with photocell. Head interchangeable with SR I and II power packs.*	$159.95
Strobonar I	Heiland Div. Minneapolis-Honeywell	80	37	6,800	1/2000	3½ lb	12 sec	4½ lb	12 sec	100					*Neon ready-light. Manual discharge switch. Built-in battery charger. Designed primarily as additional light for slave use.*	$99.50
Strobonar III	Heiland Div. Minneapolis-Honeywell	100	50	6,800	1/2000	5½ lb	6-8 sec	9 lb	8-12 sec	100					*Neon ready-light. Manual discharge switch. Built-in battery charger.*	$135.00
Strobonar IV	Heiland Div. Minneapolis-Honeywell	200	80	6,800	1/1000	13½ lb	12-14 sec	13½ lb	15-20 sec	100					*Ready-light. Manual discharge switch. Built-in battery charger. Variable light control continuously adjustable from 50-100%.*	$269.50
Strobonar V	Heiland Div. Minneapolis-Honeywell	80	40	6,800	1/1000	3¾ lb	20-30 sec				3¾ lb	3-5 sec	9-12 months 500-750 flashes	$15.95	*Neon ready-light.*	$119.50
Strobonar VI	Heiland Div. Minneapolis-Honeywell	100	40	6,800	1/650						9¾ lb	4 sec	1 year 1,500 flashes	$15.90	*Neon ready-light. High-low switch cuts light to 25% full output in low position.*	$141.60
Strobonar VII	Heiland Div. Minneapolis-Honeywell	40	28	6,800	1/2000	2 lb	3-5 sec				D Pak 3½ lb Pro Pak 2 lb	D Pak 15-20 sec Pro Pak 3-5 sec	D Pak—See Note Y. Pro Pak 9-12 mos, 1,600 flashes	D Pak $ .80 Pro Pak $15.95	*Interchangeable a-c, "D" pak and pro pak operation.*	$55.95 $77.95
Synctron Explorer Model DB-18	Dormitzer Electrical & Mfg. Co.	60	50		1/2000						5 lb	5 sec	500 flashes	$3.05		$89.50
Synctron Economy Model 215	Dormitzer Electrical & Mfg. Co.	75	35-40		1/1250	3½ lb	6-8 sec									$72.50
Synctron Professional Model 100	Dormitzer Electrical & Mfg. Co.	98	35		1/5000			10½ lb	8-10 sec							$206.50
Synctron Candid Model 200B	Dormitzer Electrical & Mfg. Co.	125	70		1/2500			6 lb	7 sec						*Nickel-cadmium rechargeable storage cell with ten-year service warranty.*	$190.00
Synctron Pro Model 200B	Dormitzer Electrical & Mfg. Co.	200	90		1/1250				15 sec full, 7 sec½ power	100 full power 200 half power					*Same as above.*	$275.00

Continued from preceding page

Model Name and/or Number	Manufacturer or Distributor	Electrical Energy Input in Watt/seconds[1]	Guide Number for Daylight Kodachrome[2]	Color Temperature[3]	Flash Duration[4]	Weight of Unit[5]	Recycle Time with A-C Operation[6]	Weight of Unit with Rechargeable Storage-Battery Operation	Recycle Time with Storage-Battery Operation[7]	Number of Flashes from One Storage-Battery Charge[8]	Weight of Unit with Dry-Battery Operation	Recycle Time with Dry-Battery Operation[9]	Shelf and Shot Life of Expendable Dry-Battery[10]	Cost of Replacement of Dry Cells[11]	Additional Data and Remarks[13]	Cost of Basic Unit[12]
Thriftlite II X	Photak Corp.	60	40	6,500	1/1000	1⅝ lb	5 sec				4½ lb	6-30 sec	1 year 1,000 flashes	$6.80	*Neon ready-light.*	$59.95
Thriftlite II and II XF	Photak Corp.	60	40	6,500	1/1000	1 lb, 11 oz	7 sec				4⅓ lb	7-15 sec	1 year, 1,500 flashes (BP2)	$6.80	*Neon ready-light.*	$59.95
Tower Speedlight No. 6853	Sears, Roebuck & Co.	106	45		1/500							5 sec				
Ultrablitz Expert IV	Interstate Photo Supply	85	55	6,500	1/1500	3⅝ lb	6 sec				4⅓ lb	6-8 sec	1 year, 100-200 flashes	$1.00	*High-low power switch for full or half power.*	$69.95
Ultrablitz Matador 400	Interstate Photo Supply	120	75	6,500	1/1000	4 lb	5 sec				5 lb	4 sec	1 year, 500-1,000 flashes	$15.90	*Same as above.*	$99.95
Ultrablitz Matador I	Interstate Photo Supply	135	75	6,500	1/1000	4⅓ lb	5 sec	4⅝ lb	5 sec	80					*Same as above.*	$99.95
Ultrablitz Reporter I	Interstate Photo Supply	225	90	6,500	1/750	8⅝ lb	8 sec	9½ lb	8 sec	100					*Visible charge indicator. Switch for operation at 100-125-225-450 watt-seconds.*	$194.50

[1]The electrical energy input in watt-seconds should not be considered the sole criterion of speedlight power as such other factors as tube efficiency, reflector design, and flash duration play an important part in this determination. *See Note X.*

[2]All figures are from manufacturers' data. To determine exposure *f*-stop, divide guide number by light-to-subject distance. Most photographers consider Daylight Kodachrome guide numbers most significant because, thus far, all Kodachrome is given unvarying Kodak machine-processing.

[3]Color temperature is given in terms of degrees Kelvin. Average noon daylight in the U.S. has a color temperature of approximately 5,900 degrees Kelvin.

[4]Most manufacturers measure flash duration by time in which unit goes from half-peak to full-peak illumination.

[5]Some units have built-in a-c power supplies; others require insertion of additional components in place of battery. In most cases, weights quoted include weight of flash-head, but some weights are for power pack alone.

[6]Most manufacturers measure recycle time to the 80% power point. Others tend to be more, or less conservative.

[7]Most manufacturers measure recycle time to the 80% power point. Data applies to properly charged and otherwise cared-for storage batteries.

[8]Figures given vary with manufacturers' willingness or refusal to accept extension of the recycle time. Obviously, the number of flashes per charge is greater if we are willing to go to longer recycle times between flashes. Note, however, the significantly larger number of flashes per charge obtained from units powered by the new nickel-cadmium storage cells.

[9]Most manufacturers measure recycle time to the 80% power point. Data generally applies to first 50 to 70% of battery life.

[10]Shelf life is usually based on battery manufacturers' data, but some speedlight manufacturers quote shorter shelf lives. Shot life with dry-battery operation is largely a matter of opinion among manufacturers as well as photographers. Most data supplied is based upon a maximum of 50% of the nominal recycle time given by the manufacturer for dry-battery operation. This applies to high-voltage dry cells as well as the new low-voltage "D"-cell power packs. *See Note Y.*

[11]Prices are manufacturers' total list for all dry batteries required.

[12]In almost all cases these list prices apply to basic power supply with one flash-head, connecting wire and bracket. Some lists include price of expendable dry batteries, others do not.

[13]This additional data and remarks are based entirely upon the information supplied us by the various manufacturers and distributors involved.

Note X: An additional method for the statistical evaluation of electronic-flash power is the measurement of beam-candle-power seconds. Although the majority of manufacturers and distributors did supply this data, it was obvious that because of different methods of measurement used the data supplied could not be used for intelligent comparisons. Once the electronic-flash industry arrives at a standard distance and field coverage and standardized procedures for taking these measurements, we will have possibly the best statistical criterion for the evaluation of relative speedlight output.

Note Y: In no case did we list the shelf or shot life of low-voltage "D"-cell packs because of the wide variations in measurement criteria employed by various manufacturers.

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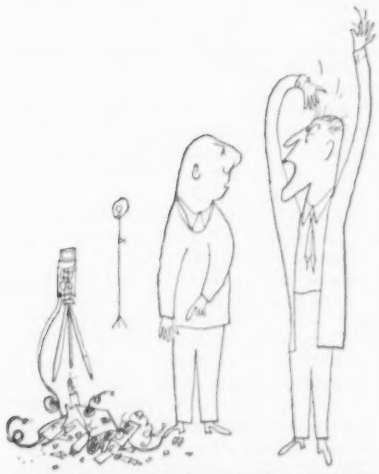
Bounce Flash for Color

(*Continued from page 58*)

bounce. This will give you a rather large area of even illumination with the lovely soft quality for which bouncelight is so famous. Shadows will be slightly defined and not deep; this is good when using color film to photograph people, because color doesn't have the latitude of black-and-white, and highly contrasty lighting usually doesn't turn out as well as it may look—the shadows can go completely black and hide detail. Point the reflector straight up at the ceiling—this spreads the light over a greater area than if you try to angle it. Don't place the stand too close to the subject or you may get shadows under the eyes which will be unpleasant. Keep the stand about six feet or so from the subject; you will then need only a slight upward tilt of the subject's head to illuminate the eyes.

If you have two lamp units, try directing their light toward the walls on either side of the subject, if possible at the intersection of wall and ceiling, where you benefit from both as reflecting surfaces. Using two lamps in this way, you will need about one stop less exposure than with a single lamp pointed at the ceiling. If the lamps are equidistant from the subject, and the subject from the walls, lighting will be even on the subject. If you want to create a slight directional effect, with light stronger on one side of the face than the other, raise one lamp nearer the ceiling or wall (to decrease the bounce distance), or move the subject nearer one of the lamps. For a stronger directional effect, bounce only one light off the wall.

If you want to create a veritable blaze of light—and have the three lamp units to do it—you can combine both methods, bouncing one lamp off the ceiling over head, the other two off the opposite walls. Actually, the addition of a third lamp overhead doesn't add another complete unit of light as far as exposure goes; you'll only have to stop down about a half stop more from the exposure for two lights off the walls, since the overhead



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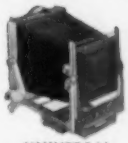

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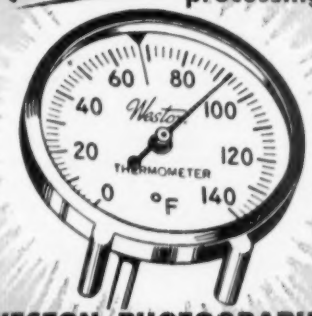

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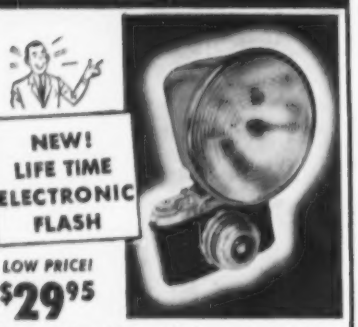

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light just fills in any shadows present. From this kind of lighting you get the wonderful, soft, almost luminescent quality which is so attractive in pictures of people, particularly children. A blast of direct flash on their thin, delicate skin is likely to make them look pasty and colorless. This brings up another point.

Even the whitest pigment we are likely to come across in sheets or paint is just slightly yellowish, and bouncing a light off a "white" surface actually tends to lower the color temperature of the light somewhat, which in turn "warms up" the transparency. With electronic flash this is particularly advantageous, since most units throw a light which is too "blue" for daylight-type color films. Most professionals also use a CC05Y or CC10Y (yellowish) filter over the lens to bring the electronic flash light into exact line with the balance of daylight film.

Bouncelight has a different image-evoking characteristic, too. It has been reflected from an essentially irregular surface, and is consequently diffused.

The usefulness of the simulated studio setup for bounce flash is further increased if you try it for fill-in work with window portraits. With the subject being lighted by a flood of light from a window, you can direct the electronic flash (almost the same color temperature as the daylight) at the ceiling or the wall, and expose only for the main window lighting. The flash will merely fill in the shadows without adding enough light on the highlights to affect the exposure.—

Boost Available Light

(*Continued from page* 50)

Seems Karger and his assistant returned from an assignment lugging a camera bag and some six or eight cases of lighting equipment. "Available-light job, eh George," sneered one of his available-light-type colleagues at the agency. "Yes," replied Karger, patting his equipment case, "it's all available."

Probably the most widely used method for putting available-light feeling and quality into pictures with good depth of field and movement-stopping shutter speeds is the use of bouncelighting. Ordinarily, the flash reflector is simply aimed smack at the ceiling and the exposure geared to the bounce from above. Unfortunately, this lighting quality which was originally pioneered as an answer to the stereotyped harshness and miner's-lantern effect of straight head-on flash, has itself become a stereotype. Who has not noticed the characteristic shadows under the nose and chin, and the deep black shadows under the eyes that mark so many bounce pictures?

But it doesn't have to be this way. When bouncelight is used not as the *sole* illumination but as *part* of the existing light, the effect can be quite different. Two points are important:

1. The bouncelight should not be so strong as to wash out and eliminate the subtle characteristics of room lighting. It should instead be just strong enough to reduce the available-light exposure so that the negative is formed partially by the flash and partially by the natural room lighting.

In most cases it is wise to use the flash or speedlight to reduce the exposure by at least one full stop, or even two stops. This is especially important when using speedlight in conjunction with focal-plane miniature cameras. Only three of the top 35's, the Contax IIa and IIIa, the M-3 Leica, and the Nikon S-2 synchronize speedlight at 1/50 second. Most other cameras give their zero-delay or "X" synch at speeds between 1/20 and 1/30 second. Synching at speeds of 1/50 or less does involve the risk of producing double images, the first from the very brief speedlight blast and the second from the existing light. If the speedlight exposure is adjusted to about two stops less than that required for the available-light, this risk is greatly reduced and no noticeable unsharpness should result.

2. The direction of the bounce should be chosen to enhance or eliminate existing light effects. If you like the way side-light from a wall fixture strikes your subject, for example, you may choose to bounce your light off the same wall. If you want to eliminate unpleasant shadows, this can be done by choosing a bounce direction which will fill them in. When the existing light does not seem to be noticeably directional, the flash may be aimed at the juncture of wall and ceiling. The spill will now come simultaneously from above and from the side.

Before we go any further, it might be well to consider the problem of estimating your exposure when using bounce flash or speedlight. Unfortunately, this can not be reduced to a simple formula. Neither can you employ an exposure meter. Whether you're using bounce in a subtle way to put additional photographic quality into an available-light picture, or whether you're using bounce as the sole source of picture illumination, figuring exposure is strictly a matter of judgment and experience. Professional bouncers who walk into a room, glance about briefly, and say to themselves, "Ah, an f/8 ceiling," don't possess any secret knowledge or mysterious techniques. What they have is experience, and much of this probably painful.

To obtain an insight into the way a pro goes about obtaining some of his savvy, watch what he does when, for example, he purchases a new speedlight unit with which he is unfamiliar. First thing he'll probably do is to go to some room in his home or office in which he's accustomed to testing his lighting equipment. Bouncing the light straight off the ceiling (taking care to keep the reflector parallel to the ceiling in order to avoid any extra spill) he'll make some pictures (usually of some unwary friend) using a wide range of lens apertures. If he's the really careful type he'll have the friend hold pieces of paper giving the *f*-stop for each shot.

These test negatives will be developed according to his standard practice for bounce shooting. After examining the negatives, and possibly running off a few prints, his next step is to test out the exposure information he's gained from this first test in familiar surroundings, by taking pictures with other bounces, other

rooms. (My apologies to Mr. Capote.) Using larger *f*-stops for higher and darker ceilings, smaller stops for lower or brighter ones, he'll soon obtain a very good notion of what his speedlight will do. After that it's a matter of using judgment in relating these test experiences with actual shooting conditions.

When bounce looks difficult and you're not sure whether anything at all is coming down because of a very high ceiling, dark walls, etc., here's a helpful hint. Cup one hand over your eyes and stare hard into some shadow portion of the subject or scene. Then fire off a test blast. If you suddenly see into your shadow areas as the speedlight goes off, you can make a picture. One friend of ours used this trick recently to estimate a bounce exposure that looked just about hopeless, a very dirty brown auditorium ceiling, some 40 feet above floor level. "I could barely see into the shadows when the flash went off," he reported, "so I shot at *f*/2." His pictures turned out just fine.

The "rule" about using the flash to reduce the available-light exposure by between one and two stops is a good one, in our experience, quite aside from the double-image problem with focal-plane shutters. If we give very much less exposure than this we are relying solely on the flash and the available light will count for nothing. The pictures then might just as well have been made in a completely dark room, and at best the pictures will resemble conventional bounce. On the other hand, if we give more exposure than this, not only do we run into the unsharp double image, but we've completely washed out the subtlety of the existing light.

This means keeping your light definitely on the weak side. With normal portable speedlights of 50 to 60 watt-seconds input, or less, this should not pose too great a problem. Professionally powered units with 100 or more watt-seconds input must be handled more carefully. If you're shooting conventional flash, it may be necessary in some cases to choose a lamp somewhat weaker than the No. 5 or 25, which is so popular today. Although we've never tried it, the midgets like the No. 8 and the new M-2 bulb look very promising.

On-the-spot methods of reducing the effectiveness of bouncelight include such obvious solutions as: bouncing from farther away so that only part of the light which strikes the reflecting surface will fall upon the subject; moving the reflector in very close to the wall or ceiling so that the blast from the reflector is concentrated like a spot and letting only a portion of this illumination spill onto the subject; putting a handkerchief over the reflector or flash-head; intentionally choosing a poor reflective surface for your bounce, etc.

The most important thing is to gain experience first in familiar home situations before shooting with serious intent. Although bounce technique is hard to pin down and defies the formulation of exact rules, it is nevertheless one of the easiest photographic techniques to master, providing one has a willingness to make a small investment in experience.—

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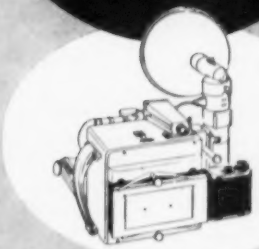

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BUYING GUIDE

Air Photo Supply Corp. 151
Awon Films 138
Brooks Cameras 117
Camera Import Corporation 133
Century Photographic Equipment Co. 144
Cinema Lens Co. 152
Cohen's Exchange, Inc., Abe 145
Color King Labs 126
Delpro Sales Co. 144
Delta Photo Supply 153
Dowling's Fifth Avenue 107, 108, 109, 110, 111, 112
Freestyle Sales Co. 132
Grand Central Camera 118, 119
Haber & Fink, Inc. 134
Minifilm Camera Corp. 136, 137
Olden Camera & Lens Co. 114, 115
Panoram Film Labs 158
Peerless Camera Stores 120, 121, 122, 123, 124, 125
Penn Camera 128, 129
Photographic Importing & Distributing Corp. 154
Ritz Camera Centers 148, 149
Servicemen's Color Print Co. 158
Spiratone, Inc. 140, 141
Sterling-Howard 151
Supreme Photo Supply Co. 143
Wall St. Camera Exch. 147
Western Photo Sales 158
Willoughbys 127, 135, 139

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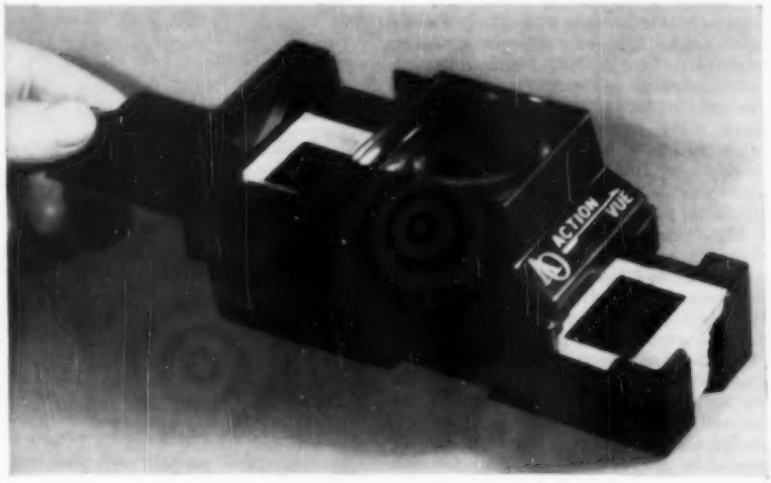

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A further factor is the lack of control over whatever light may be available. Sometimes there's so much that viewing is quite uncomfortable; at other times the light may be so dim that your slides look badly underexposed. Even with the best of viewerless conditions, after you've held a number of slides up to the light, often in awkward positions for the observers, they soon get tired of straining to see the tiny images and turn elsewhere for entertainment.

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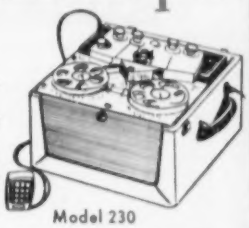

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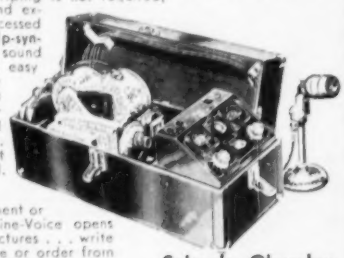

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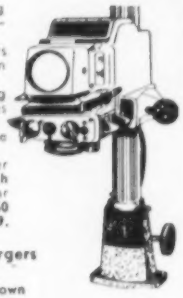
Durst Enlargers

DURST 35mm MICROMAT COLOR ENLARGER



- Automatic focusing for miniature and sub-miniature sizes; also used for micro-copying
- Distortion control—horizontal and vertical—with built-in adjustment lever
- Filter slot for standard color correction filters
- Illuminated scale indicates magnification factors
- Baseboard has power switch, cord and plug
- Patented luminous diaphragm ring makes lens stops visible in darkroom
- Plus many, many other important, exclusive features

COMPLETE MICROMAT unit with Schneider Componon coated 50mm f/4.0 lens **$285. Cash or $28.50 Down**; or with Schneider Componar coated 50mm f/3.5 lens **$265. Cash or $26.50 Down.** Optional: Micro Copy Attachment **$139. Cash or $13.90 Down.**

Other Superb new 1956 DURST Enlargers

Reporter Portable "35" **$ 59.50 Cash or $5.95 Down**
D609 2½ x 3½ Enlarger **119.50 Cash or 11.95 Down**
Unomat Color Enlarger (to 2¼ x 3¼, with lens) **249.50 Cash or 24.95 Down**
Duomat Color Enlarger (to 2½ x 3½, with lens) **375.00 Cash or 37.50 Down**
Laborator 35 (5 x 7) Enlarger and Copy Camera **695.00 Cash or 69.50 Down**

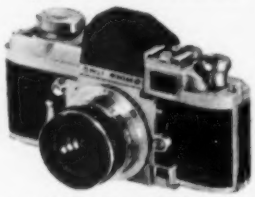
Write DOWLING'S Fifth Avenue **today** for **free** brochure on extraordinary new DURST products. D. F. A. ships all DURST equipment with express and insurance prepaid!

America's Largest and Most Distinguished *Mail Order Camera Specialists*

• Integrity • Reliability

ALPA the ALL-IN-ONE 35mm Camera

precision-built in Switzerland



- **Optional Focusing:** Single-lens reflex groundglass or individual, single-window, coupled rangefinder AND multi-focal "sportstype" viewfinder.
- **Unsurpassed Optics:** Every one of the coated, high-resolving power ALPA lenses (wide angle through 3750mm!) is individually tested, carries an unconditional guarantee. Choice of click stops or FULLY automatic diaphragm with 50mm lenses.
- **Are you a perfectionist? Here's your answer:** The superlative Kern Switar 50mm coated f/1.8 APOCHROMAT, the **only** lens for 35mm cameras correcting all 3 primary colors, including red. Gives critical definition even at full aperture, f/1.8 (200 lines per mm.).
- ***Your Choice of Lens Determines Price of Camera***
- **Unique Eveready Case:** Holds ALPA with wide angle, 50, 75 or 90mm lens; **plus** sunshade, filters and exposure meter.

	ALPA 5 (Prism Reflex)	10% Down	ALPA 7 (Prism Reflex & Range-finder)	10% Down
Schneider Xenon 50mm coated f/1.9 with FULLY automatic diaphragm	$389.00	$38.90	$429.00	$42.90
Kern Switar 50mm coated f/1.8 APOCHROMAT with FULLY automatic diaphragm	419.00	41.90	459.00	45.90
Macro-Kilar E 40mm coated f/3.5	314.00	31.40	354.00	35.40
Macro-Kilar D 40mm coated f/3.5	339.00	33.90	379.00	37.90

Selected ALPA Wide Angle and Telephoto Lenses

Angenieux Retrofocus 28mm coated f/3.5 lens	$ 139.00
Old Delft Alfinar 38mm coated f/3.5 lens	89.00
Schneider Xenar 80mm coated f/2.0 lens	169.00
Schneider Tele-Xenar 90mm coated f/3.5 lens	119.00
Old Delft Algular 135mm coated f/3.2 lens	129.00
Zoomar Reflektar 3750mm coated f/25.0 lens	3500.00

It's Sensational!

NEW FME

Two-Speed, High-Fidelity TAPE RECORDER

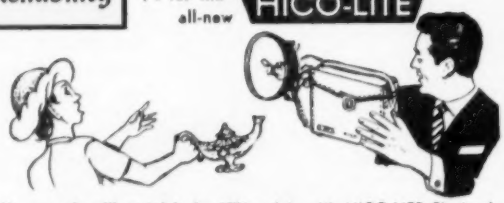
- **Dual speed: 3¾" and 7½" per second**
- **High-fidelity that will delight the most discriminating user**
- **Two-hour playing time**
- **Single knob control for quick, easy operation**
- **Neon record level indicator**
- **Radio-phono-TV input jack**
- **External speaker jack for large audiences, or for ear-phones**
- **Compact, light, attractively styled and sturdy two-toned case**
- **Plus a host of other features usually found only in machines selling for twice the price**
- **Foot pedal stop switch available as accessory**

only $139.95 Cash or
Only $13.95 DOWN

Superb FME Model 47-A also available. $159.50 Cash or $15.95 Down!

Aladdin . . . Trade in Your Lamp!

. . for the all-new **HICO-LITE**



Your magic will certainly be 1956-variety with HICO-LITE Electronic Flash at your command. New worlds of picture-making possibilities will literally open before your eyes. The story is too big and too important for details here. Suffice to state: In advanced design, compactness and light-output — HICO-LITE is in a class by itself. Write directly to DOWLING'S Fifth Avenue **today** for **all** the facts. You'll learn about a rigid guarantee unlike anything else in the electronic flash industry. You'll read about HICO-LITE **convertibility** — an amazing account of how your 109 Pro Deluxe may be modified to a 228 Deluxe or even to a Deluxe Portable Portrait Unit, at any time, without scrapping or trading your existing equipment!

Or, here are the essentials for immediate ordering:

HICO-LITE 109 Pro Deluxe (complete with battery and shutter cord) **$124.50 Cash or $12.45 Down**
HICO-LITE 228 Deluxe (complete with battery and shutter cord) **194.50 Cash or 19.45 Down**
HICO-LITE AC Conversion Pac **27.50 Cash or 2.75 Down**
HICO-LITE Deluxe Portable Portrait Unit **349.50 Cash or 34.95 Down**

Free postage and insurance — of course! **Really** easy — interest-free — terms: Naturally . . . when your order is mailed directly to DOWLING'S Fifth Avenue!

USE COUPON ON NEXT PAGE TO REQUEST YOUR COPY OF OUR COMPLETE NEW 1956 CATALOG . . . IT'S *FREE!* MEANWHILE BUY *ANY* CURRENTLY ADVERTISED PHOTOGRAPHIC PRODUCT FROM D. F. A. JUST SEND IN YOUR ORDER *TODAY!*

Dowling's FIFTH AVENUE

10% DOWN

NO EXTRA CHARGE FOR CREDIT

NO INTEREST!

• 30 DAY FREE TRIAL • LIFETIME GUARANTEE

• FREE POSTAGE AND INSURANCE TO ALL POINTS, INCLUDING APO'S AND FPO'S. HOURLY AIRSHIPMENTS EVERYWHERE.

EASY PAYMENTS FOR CIVILIANS AND SERVICEMEN THE WORLD OVER!

The incomparable new 1956 Leica M-3

Leica M-3 w/ Elmar coated f/3.5 lens $348. Cash or $34.80 Down
Leica M-3 w/ Summicron coated f/2.0 lens 447. Cash or 44.70 Down
Leica M-3 w/ Summarit coated f/1.5 lens 468. Cash or 46.80 Down
Leica M-3 Body without lens 288. Cash or 28.80 Down

LEICA M-3 ACCESSORIES

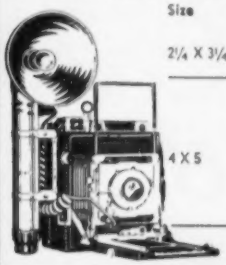
Summaron-M coated 35mm f/3.5 lens	$ 99.00 Cash or	$ 9.90 Down
Elmar-M coated 90mm f/4.0 lens (standard mt.)	93.00 Cash or	9.30 Down
Elmar-M coated 90mm f/4.0 lens (collapsible)	150.00 Cash or	15.00 Down
Hektor-M coated 135mm f/4.5 lens	141.00 Cash or	14.00 Down
Leica Meter-M	30.00 Cash or	3.00 Down
Adapter, standard Leica lenses to M-3	10.50 Cash or	1.05 Down

OTHER SUPERB NEW LEICA PRODUCTS

Stemar (Leica Stereo), complete	$297.00 Cash or	$29.70 Down
Valoy II Enlarger	96.00 Cash or	9.60 Down
Leica IIf with Elmar coated f/3.5 lens	$177.00 Cash or	$17.70 Down
Leica IIf with Summaron coated f/3.5 lens	216.00 Cash or	21.60 Down
Leica IIIf with Elmar coated f/3.5 lens	237.00 Cash or	23.70 Down
Leica IIIf with Summaron coated f/3.5 lens	276.00 Cash or	27.60 Down
Leica IIIf with Summicron coated f/2.0 lens	336.00 Cash or	33.60 Down
Leica IIIf with Summarit coated f/1.5 lens	357.00 Cash or	35.70 Down

1956 Pacemaker GRAPHIC OUTFITS

All brand new, latest models, with factory guarantee! Includes: • Graflok back • Ektalite screen • new Graphic coupled rangefinder with Rangelite and automatic parallax viewfinder • new full image wire finder • Graflite 3 cell flash gun • deluxe case • film pack adapter or roll film holder • 6 cut film holders • adapter ring • sunshade • 4 filters. Prices below include all this extra equipment! Easy payments available!



Size	Coated Lens in Shutter	Speed Graphic	Crown Graphic
2¼ X 3¼	101mm Ektar f/4.5 (1/800 sec.)	$338.	$300.
	105mm Tessar f/3.5	355.	306.
	105mm Ektar f/3.7	343.	294.
4 X 5	135mm Schneider Xenar f/4.7	337.	291.
	135mm Optar f/4.7	354.	305.
	127mm Ektar f/4.7	354.	305.
	135mm Tessar f/4.5	370.	326.
	150mm Schneider Xenar	381.	334.
	150mm Tessar f/4.5	381.	334.
	152mm Ektar f/4.5	371.	327.
	135mm Schneider Xenar f/3.8	388.	344.
	150mm Tessar f/3.5	448.	400.
	150mm Schneider Xenotar f/2.8	568.	524.

New Graphic rangefinder is manufactured for 4 X 5 cameras only. 2¼ X 3¼ outfits are supplied with Kalart coupled rangefinder.

New 1956 Revere 888

Automatic Projector

Runs by itself! Model "553" (300 watt, automatic) $69.50 Cash or $6.95 Down; Model "555" (500 watt, automatic) $79.50 Cash or $7.95 Down; Model "888" (500 watt fully automatic) $119.50 Cash or $11.95 Down.

1956 MINOX III-S

Fabulous! Weighs 2½ ozs.; 3" long. Automatic transport takes 50-exposure film. Built-in flash; 9 speeds to 1/1000th sec.; sharp f/3.5 lens. With case and chain $139.50 Cash or $13.95 Down. Accessory reflex finder $27.50; right-angle finder $14.95.

1956 GRAPHIC 35

Just Out!

Years ahead in modern design and performance! New coupled rangefinder with Push-Button focusing; full flash synch' with Spectramatic settings; Graflar coated f/3.5 lens. Only $77.50 Cash or $7.75 Down. Complete with flash unit and case $89.50 Cash or $8.95 Down.

New 1956 Automatic Kodak VR

With fully automatic diaphragm lens listed: Tessar f/2.8 $259.50 Cash or $25.95 Down; Westagon f/2.0 $289.50 Cash or $28.95 Down; Biotar f/2.0 $345. Cash or $34.50 Down; Xenon f/1.9 $351.70 Cash or $35.17 Down. With Pentaprism R/F add $47. Cash or $4.70 Down.

ALL NEW 1956 RETINA IIIc

Built-in exposure meter and with normal Xenon coated f/2.0 lens in M-X shutter —$190. Cash or $19.00 Down. Optional: Curtar 35mm coated f/5.6 wide angle lens $62.50 Cash or $6.25 Down; Longar 80mm coated f/4.0 telephoto lens $82.50 Cash or $8.25 Down. Retina IIc $139.50 Cash or $13.95 Down.

new 1956 Nikon S-2

Life-size rangefinder/viewfinder; rapid film transport; full synch'; speeds to 1/1000th sec. With Nikkor coated f/2.0 lens $299.50 Cash or $29.95 Down; or with Nikkor coated f/1.4 lens $345. Cash or $34.50 Down. A real gem!

1956 Linhof Super Technika Cameras

4 X 5 model with multifocus rangefinder, universal back and 150mm Xenar coated f/4.5 lens $419.70 Cash or $41.97 Down. Linhof 2¼ X 3¼ outfit with multifocus rangefinder and 3 lenses complete $564.15 Cash or $56.41 Down.

1956 POLAROID Land Cameras

Highlander Camera only $69.95 Cash or $6.95 Down. Complete Highlander outfit: camera, flash, meter, case for outfit, and 3 rolls of film only $97.50 Cash or $9.75 Down! Speedliner $89.75 Cash or $8.97 Down; Pathfinder $249.50 Cash or $24.95 Down.

1956 HASSELBLAD Model "1000-F"

—superlative 2¼ X 2¼ single lens reflex with crisp Ektar coated f/2.8 and speeds to 1/1000th sec.: $379.50 Cash or $37.95 Down. NEW Super-wide Model with 38mm Zeiss Biogon coated f/4.5 lens $489.50 Cash or $48.95 Down.

NEW Models 1956 Rolleis

Rolleicord V with Xenar f/3.5 lens $134.55 Cash or $13.46 Down. Rolleiflex with Xenar f/3.5 lens $217.50 Cash or $21.75 Down; or with Tessar f/3.5 lens $232.50 Cash or $23.25 Down. Just out—Rolleiflex 2.8D with Xenotar f/2.8 lens $291.50 Cash or $29.15 Down.

new BOLEX H-16 Supreme

New model . . . just released! Complete with 3 top Kern lenses: Switar 1" f/1.4, Switar 16mm f/1.8, Switar 50mm f/1.4 —plus compartment case $824. Cash or $82.40 Down. Bolex H-16 Leader with Lytar 1" f/1.9 lens $269.50 Cash or $26.95 Down.

Complete 1956 Keystone 5-Unit Movie Outfit

Top-quality Olympic 8mm turret camera with normal f/2.5 lens, Kinotar wide angle f/2.5 lens, Kinotel telephoto f/3.5 lens, latest Brockway M-3 exposure meter, plus roll 8mm Kodachrome film. Complete $139.50 Cash or $13.95 Down.

ALL EQUIPMENT LISTED IS BRAND NEW—FACTORY PACKED. OUR STOCKS OF BOTH USED AND NEW EQUIPMENT ARE HOWEVER MOST EXTENSIVE. PLEASE WRITE FOR ANYTHING PHOTOGRAPHIC

Dowling's 175 FIFTH AVENUE, NEW YORK 10, N. Y.
in a N. Y. Landmark, the Flatiron Bldg. at 23rd St.
Mail Order Showroom, Suite 2000. Tel.: ORegon 4-7900

P-156

Please ship the following immediately: .....

Enclosed is $..... ☐ Down Payment ☐ Complete Payment.
I agree to pay $..... monthly for..... months until merchandise is paid for.
I wish to trade in: .....
☐ Give me tentative allowance by mail.
☐ I am shipping equipment for exact allowance.
Your trade-in may be used as down payment! It will be returned at D.F.A.'s expense if you don't accept our top offer.
☐ Send FREE literature on .....
☐ Send FREE 1956 Catalog. ☐ Send pamphlet on "Deferred Payments."

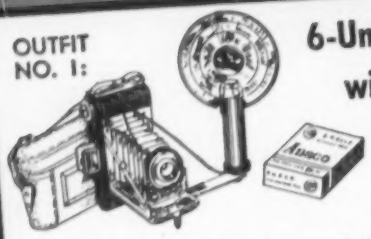
Name.....
Address.....
City or Town..... State.....

MAIL TODAY

SAVE Dollars at *Dowling's* FIFTH AVENUE

Never before a sale like this! Save up to 50% and more on BRAND NEW *Ansco* camera outfits with D.F.A. imported flash units!

OUTFIT NO. 1:

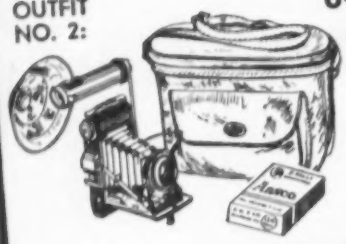


6-Unit Camera Outfit with *Ansco* Viking Readyset

Agfa Isomar lens. Instant shutter and lens setting for trouble-free shooting! 8 large black and white or color pictures on 120 film. **Complete** with ANSCO eveready case, flash unit, and 3 rolls of ANSCO All-Weather film.

From D. F. A. only . . . **$16.95** Regularly $32.84 Save $15.89!

OUTFIT NO. 2:



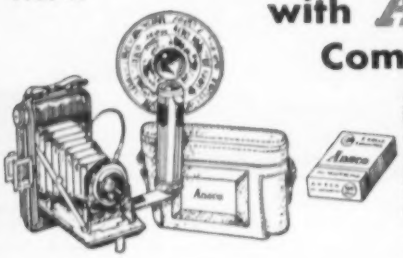
6-Unit Camera Outfit with *Ansco* Viking f/4.5

Agfa Agnar f/4.5 zone-focusing lens. Self-timer shutter; speeds to 1/200th sec. Body shutter release for smooth shooting. Optical finder and accessory shoe. 8 large pictures to a roll. **Complete** with roomy gadget bag, flash unit and 3 rolls of ANSCO All-Weather film.

From D. F. A. only . . . **$29.50** Regularly $60.39 Save $30.89!

OUTFIT NO. 3:

6-Unit Camera Outfit with *Ansco* Commander



Agfa Agnar f/6.3 zone-focusing lens. Vario synchronized shutter with speeds to 1/200th sec. 8 large pictures to a roll. **Complete** with ANSCO genuine leather case, flash unit and 3 rolls of ANSCO All-Weather film.

From D. F. A. only . . . **$21.95** Regularly $45.64 Save $23.69!

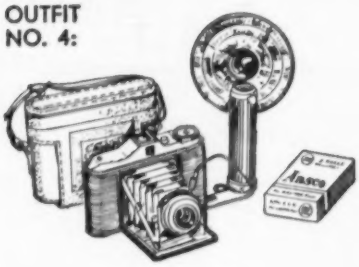
Here's DOWLING'S Fifth Avenue quality at never-before LOW, LOW prices! Because D. F. A. is the leader in the new, fine camera field—we don't dabble in off-beat "buys." This special, first-ever sale comes instead from our unique purchasing power with top camera manufacturers. And the unprecedented savings are passed along to YOU! Just look at these BRAND NEW, FACTORY PACKED, complete camera outfits: All are the latest, current 1956 models!

ANSCO folding cameras are ultra-modern and streamlined. They GET MORE PICTURES . . . because they are compact enough to go ANYWHERE. Touch a button and your ANSCO camera snaps to attention—ready for instant action! Yet every ANSCO camera shown here uses popular 120 roll film for large-size album prints. All are products of world-famous Agfa Camera Werk, Munich, Germany. Eveready cases and film are by ANSCO, U.S.A. Luxurious gadget bags and flash units are exclusive D.F.A. (not Ansco) products. *Every* unit is top-notch. All function together as a smooth team, giving you perfect pictures every time!

You'll receive a COMPLETE 6-unit outfit, exactly as illustrated. Each outfit is covered by DOWLING'S Fifth Avenue distinctive LIFETIME GUARANTEE and 30 DAY FREE TRIAL privilege.

Check over these exciting outfits NOW. Treat yourself. Treat your family and friends. These DO make perfect gifts. NOT sold through local dealers. Available ONLY from D. F. A. Don't delay. Make sure YOU capture this once-in-a-lifetime opportunity! Mail your order DIRECTLY to DOWLING'S Fifth Avenue TODAY!

OUTFIT NO. 4:



6-Unit Camera Outfit with *Ansco* Speedex

Agfa Agnar f/4.5 zone-focusing lens. Flash synchronized Vario shutter, with speeds to 1/200th sec. 12 album-size pictures on 120 film. Optical viewfinder and accessory shoe. **Complete** with ANSCO top-grain case, flash unit and 3 rolls of ANSCO All-Weather film.

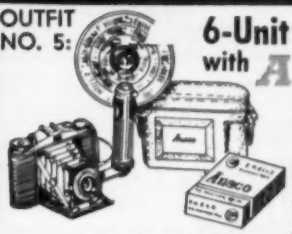
From D. F. A. only . . . **$29.50** Regularly $45.39 Save $15.89!

Dowling's **175 Fifth Avenue, New York 10, N. Y.**

FIRST-EVER *Ansco* CAMERA SALE!

Cash in NOW on **Dowling's Fifth Avenue** biggest ***Ansco*** camera scoop of the year! Tremendous values!

OUTFIT NO. 5:



6-Unit Camera Outfit with *Ansco* Speedex f/4.5 Special

Agfa Apotar f/4.5 zone-focusing lens. Prontor SV shutter, with 8 speeds from 1 full sec. to 1/300th sec. Built-in self timer. Full synch' for all flash and electronic units. Double exposure prevention lock. Body shutter release; optical viewfinder; accessory shoe—plus a host of other valuable features! **Complete** with ANSCO eveready case, flash unit and 3 rolls of ANSCO All-Weather film.

From D. F. A. only . . . **$34.95** Regularly $63.39 **Save $28.44!**

OUTFIT NO. 6:

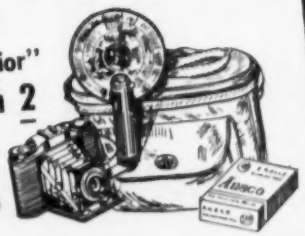
6-Unit Camera Outfit with *Ansco* Speedex Special "R"

This is "tops" in the famous Speedex line! Agfa Apotar f/4.5 zone-focusing lens. Prontor SVS 8 speed shutter, with built-in self-timer. Fully synchronized for every type of flash. Double exposure prevention mechanism. PLUS . . . independent built-in **rangefinder** combined with viewfinder! Removes all guess work and insures needle-sharp focusing everytime! The Special "R" delivers 12 album size prints on 120 film. **Complete** with handsome gadget bag, flash unit and 3 rolls of ANSCO All-Weather film.

From D. F. A. only . . . **$39.50** Regularly $70.89 **Save $31.39**

OUTFIT NO. 7:

12-Unit "Pop and Junior" Outfit with 2 *Ansco* Cameras



Now you can treat yourself and treat Junior too! Imagine: You'll receive the **complete** ANSCO Viking Readyset Outfit No. 1 AND the superb, **complete** ANSCO Speedex Special "R" Outfit No. 6! A total of 12 units: 2 fine cameras; 2 flash units; Viking case; Speedex Special "R" gadget bag; and 6 rolls of ANSCO All-Weather film! Yours will really be a "photographic" family! (BOTH outfits complete!).

From D. F. A. only . . . **$49.95** Regularly $103.73 **Save $53.78!**

YOUR Christmas will be Merry, too, with ANSCO Camera Outfits under your tree!

ALL outfits shown are available ONLY from DOWLING'S Fifth Avenue. Mail your order TODAY directly to our New York headquarters. Postage and insurance FREE the world-over — including A. P. O. and F. P. O. addresses!

ANSCO FILM FURNISHED IN HANDY 3-ROLL PAK!

RUSH ORDER FORM

Please check the **complete** ANSCO outfits you want. It's first come—first served on this scoop of the year!

- ☐ 1. ANSCO Viking Readyset 6-Unit Camera Outfit $16.95
- ☐ 2. ANSCO Viking f/4.5 6-Unit Camera Outfit 29.50
- ☐ 3. ANSCO Commander 6-Unit Camera Outfit 21.95
- ☐ 4. ANSCO Speedex 6-Unit Camera Outfit 29.50
- ☐ 5. ANSCO Speedex f/4.5 Special 6-Unit Camera Outfit 34.95
- ☐ 6. ANSCO Speedex Special "R" 6-Unit Camera Outfit 39.50
- ☐ 7. ANSCO "Pop and Junior" Special Two-Camera (12-Unit Outfit) 49.95

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In a N. Y. Landmark, the Flatiron Bldg. at 23rd St.
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P-156

Enclosed is $..... for the special ANSCO outfits checked on the accompanying RUSH ORDER FORM.

- ☐ Please address the shipment as shown below *.
- ☐ I want several outfits sent to various addresses. A note with complete shipping instructions is attached.
- ☐ Please gift-wrap. No charge for this service!
- ☐ Enclose a gift card with my name as donor: .....

* Ship to (Name): .....

Address: ..... MAIL TODAY

City or Town: ..... State: .....

MORE of D.F.A.'s 6 Page Guide to the *best* in Photographic Equipment!

Dowling's
FIFTH AVENUE

Visit our Skyline Suite to say "Hello!"

Hitch your wagon to the star! . . .
1956 CONTAX II-A and III-A

ZEISS IKON

Single-window for rangefinder and viewfinder, metal focal plane shutter, removable back, bayonet lens mount, delayed action release, full built-in flash synchronization are just a few of the reasons for the acknowledged leadership of CONTAX! Contax II-A with Tessar coated f/3.5 lens **$261. Cash or $26.10 Down**; with Sonnar coated f/2.0 lens **$345. Cash or $34.50 Down**; or with Sonnar coated f/1.5 lens **$374. Cash or $37.40 Down.** For Contax III-A (with built-in exposure meter) add **$38. Cash or $3.80 Down.**

Selected Contax Lenses and Accessories

Biogon 21mm f/4.5	$249.00 Cash or $24.90 Down
Biogon 35mm f/2.8	183.00 Cash or 18.30 Down
Planar 35mm f/3.5	102.00 Cash or 10.20 Down
Triotar 85mm f/4.0	106.00 Cash or 10.60 Down
Sonnar 85mm f/2.0	229.00 Cash or 22.90 Down
Sonnar 135mm f/4.0	146.00 Cash or 14.60 Down
Stereotar C, 35mm f/3.5's	159.00 Cash or 15.90 Down
Stereo Prism Attachment	37.00 Cash or 3.70 Down
Stereo Viewfinder	10.00 Cash or 1.00 Down

1956 ▲ IKOFLEX

Ikoflex I-A with Novar coated f/3.5 lens in Prontor full synch' shutter **$76. Cash or $7.60 Down; Ikoflex I-A** with Tessar coated f/3.5 lens in Prontor full synch' shutter **$96. Cash or $9.60 Down;** and the superlative **Automatic Ikoflex II-A** with Tessar coated f/3.5 lens in Synchro-Compur MX shutter **$126. Cash or $12.60 Down.**

1956 CONTAFLEX

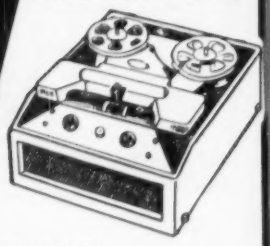
The gem of all 35mm Single Lens Reflex cameras! Ground-glass eye-level focusing is combined with split image rangefinder. Superb Tessar 45mm coated f/2.8 lens, with fully automatic diaphragm. Contaflex I **$169. Cash or $16.90 Down;** Contaflex II (Built-in meter) **$199. Cash or $19.90 Down.**

Just released! . . . Brand new 1956 CLIPPER

THE SUPERB **Pentron** **PORTABLE** TAPE RECORDER

With Exclusive MONOMATIC* CONTROL

MONOMATIC is a single knob control providing instant selection of Record or Play, in either 7½" or 3¾" tape speeds, as well as Fast Forward and Fast Rewind. Any position may be selected by a flick of the finger, in either tape speed.



The CLIPPER
(Don't confuse with discontinued models)
Regularly $129.50. Now, from D. F. A., only **$99.50**

Cash or only $9.95 Down

- **Plays in any position!**
- **Simplest to operate**
- **High fidelity performance**
- **2-speed, 2-hour operation**

DOWLING'S Fifth Avenue also features
Pentron Multi-speed Portable Tape Recorder.
$189.50 Cash or $18.95 Down
Pentron 3 Speaker High Fidelity Tape Recorder for life-like dimensional presence.
$225.00 Cash or $22.50 Down

Hi-fi enthusiasts! Write D. F. A. for free brochure on Pentron low cost hi-fi tape components for portable use and custom installations!

A Cordial Invitation...

No doubt about the ease of shopping by mail! . . . But it is nice to meet personally our mail order friends. Whether to say "hello" or to talk cameras, you'll find a warm welcome! Our Mail Order Division is on the 20th Floor (Skyline Suite) of that famous landmark, the Flatiron Building . . . The panoramic view of New York is most photogenic. When you are in our home town, please do stop in!

Shoot flash the modern way . . .

The MIGHTY LIGHT way!

Forget—forever—costly, clumsy flash bulbs!

Both 1956 MIGHTY LIGHT models are ultra-compact, inexpensive Speedlights . . . packing a "mighty" punch! Flash tube is rated for 100,000 flashes of 1/1000th sec. duration. The Battery Pack is about the size of 2 packs of playing cards (put end to end) and weighs just a little over a pound. It swings from your shoulder, or fits the base of your camera, with an accessory Battery Pack Holder ($4.95.) MIGHTY LIGHT STANDARD units have a Flash Head only 7" high, no thicker than a broom stick. Guide number is 160 for medium speed black and white film; 30 for Kodachrome. Batteries rated 2,000 flashes. Light intensity with MIGHTY LIGHT DELUXE is, of course, substantially greater: One full f/ stop. Guide number for medium speed black and white film is 220; for Kodachrome — 45.

MIGHTY LIGHT Standard AC Unit	$44.95 Cash or $4.49 Down
MIGHTY LIGHT Standard BATTERY unit with batteries	64.95 Cash or 6.49 Down
MIGHTY LIGHT Standard COMBINATION unit (AC, Battery Pack, Rejuvenator)	79.95 Cash or 7.99 Down
MIGTY LIGHT DELUXE AC Unit	59.95 Cash or 5.99 Down
MIGHTY LIGHT DELUXE BATTERY Unit with batteries	79.95 Cash or 7.99 Down
MIGHTY LIGHT DELUXE COMBINATION unit (AC, Battery Pack, Rejuvenator)	94.95 Cash or 9.49 Down

Famous MIGHTY LIGHT **Close-up Ring** replaces the regular flash tube. It's a patented ring light fitting around the lens of any camera. The "cold light" gives clear, sharp, shadowless close-up pictures. Physicians and dentists can use the **Close-up Ring** within inches of a patient's eyes without creating discomfort. The accessory **Close-up Ring** (used of course with your basic MIGHTY LIGHT) is priced at only **$39.95 Cash or $3.99 Down.**

Inquire also about MIGHTY LIGHT Slave Units!

UHLER Cine Printers
. . . the standard of perfection!

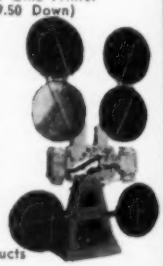
Uhler 16mm Sound Cine Printer! (illustrated)

Makes contact prints of both sound and silent pictures in black and white or color. Prints picture and sound at the same time. 400' capacity; beautiful precision finish. Copies of all your favorite films can be made at about one-quarter the cost of the original. It's easy and lots of fun to make your own prints at home. Titles may be made with double exposed motion background as shown in theatres. Complete instructions are furnished with each machine.

$125. Cash or $12.50 Down

◀ (Uhler 16mm Silent Cine Printer **$95. Cash or $9.50 Down**)

Uhler Combination 8mm and 16mm Continuous Printer ▶ (illustrated)



For professional or amateur movie makers, laboratories, schools and technicians—where the highest quality prints are required. Black and white or color; single or double system sound — film is run through the machine once only. 1200' capacity. Printing speed up to 1600' per hour. Lamps are air-cooled. Built-in filter holder for color film printing.

$685. Cash or $68.50 Down

Other Uhler Precision Cine Products

Combination 35mm Continuous Printer for Sound or Silent Pictures (capacity — 6-1200' feed and take-up discs)	$1145.00 Cash or $114.50 Down
Reduction and Enlarging Printer for 8mm and 16mm (1200' capacity)	1056.88 Cash or 105.68 Down
Reduction and Enlarging Printer for 16mm and 35mm (capacity — 4-1200' feed and take-up discs)	2475.00 Cash or 247.50 Down

Dowling's 175 Fifth Avenue, New York 10, N. Y.

Confused About Films?

Here's a rundown on all the new Kodak, Ansco, and Polaroid emulsions

By BOB SCHWALBERG

For the benefit of those readers who may, quite understandably, be confused by all the changes that have recently taken place in color and black-and-white films, here's a summary of the situation as it existed when we went to press.

Kodak Color Transparency Films: 35-mm and No. 828 rolls

In the miniature format, two Kodak color films are now supplied: Kodachrome and E-2 Ektachrome. For exposure meters calibrated in the ASA system, Daylight Kodachrome has a speed index of 10, while Daylight E-2 Ektachrome is rated at 32.

Type A Kodachrome, previously supplied for use with photofloods burning at 3,400 degrees Kelvin, and rated at ASA 16, has been discontinued. After present dealer stocks have been exhausted, this film will no longer be available. In its place, Kodak is now releasing Type F Kodachrome, which is balanced for use with clear, wire-filled flashbulbs without the need for any correction filter. The tungsten version of E-2 Ektachrome is also a Type F film.

Because Type F Kodachrome and E-2 Ektachrome are designed primarily for use with flash, their speeds are given in terms of flash guide numbers rather than in conventional speed indexes. The flash guide numbers recommended for Type F E-2 Ektachrome are slightly higher than those listed for Type F Kodachrome. For example, with a shutter speed of 1/50 second, the guide number recommended for Type F, E-2 Ektachrome with a No. 5 or 25 flashbulb is 95. With the same shutter speed and lamp, the guide number for Type F Kodachrome is 85.

Both Kodachrome and Ektachrome Type F films can be used in daylight with the Type F Filter (Wratten No. 85C). In this event, the speed of Type F Kodachrome becomes ASA 10, while Type F, E-2 Ektachrome should be rated at ASA 20.

In order to use either of these Type F color emulsions with standard 3,400 K photofloods, a blue filter must be used because the Type F emulsions are balanced at between 3,800 and 4,000 K for clear, wire-filled flashbulbs. Eastman recommends the Wratten No. 82 A Light Balancing Filter when using either Type F Kodachrome or Ektachrome with standard photofloods. The speed of Type F Kodachrome with the 82 A filter becomes ASA 10, while Type F Ektachrome becomes ASA 16. A further recommendation is made for using Type F Kodachrome with 3,200 K professional studio lamps. In this case a Wratten 82 C Light Balancing Filter is specified with a meter setting of ASA 8.

The two Kodachrome emulsions, Daylight and Type F, will henceforth be sold without the inclusion of a processing charge. This change is being made in accordance with the now famous Federal Court Decree of December 1954 under which Kodak agreed to license other firms to process Kodachrome. Kodachrome film already purchased with the processing charge included in the price of the film will continue to be processed at no additional charge by the Eastman Kodak Company. Kodachrome labeled "Film Price Does Not Include Processing," contains a green return bag instead of the previous yellow mailing bag. This film must be returned to the dealer, who will then forward it to Kodak or some other processing laboratory of his choice.

Kodak has also discontinued the spooling of Kodachrome 335 films for stereo cameras. The need for this special spooling no longer exists now that the processing and mounting charges are not included in the film's selling price. Stereo-camera owners are advised to use standard 135 Kodachrome loads and order stereo mounting at the time the film is delivered for processing. The 20-exposure cartridges will yield 15 stereo pairs and the 36-exposure loads 28 stereo pairs.

E-2 Ektachrome is a "consumer processing" material which will not be processed by Kodak. Most color photofinishers now process this emulsion, and processing kits are available for home processing as well. Make very certain, however, that the kit specifies "Ektachrome Process E-2," as the earlier E-1 kits will not work with the new Ektachrome.

Ansco Color Transparency Films: 35-mm and No. 828 Rolls

Ansco has completely discontinued the manufacture of its long-established color material, Ansco Color, and switched to the new Anscochrome emulsion. This film is rated at 32 Daylight. As of this writing, no tungsten version of Anscochrome has made its appearance, but a Type F Anscochrome balanced at 3,800 K for use with clear, wire-filled flashbulbs has been announced.

Anscochrome can be processed by the user, sent to one of many commercial labs now handling this film, or returned directly to Ansco in Binghamton, New York. Films returned to Ansco for processing should be accompanied by the $1.25 processing charge.

Kodak Color Transparency Films in Rolls:

All Kodak roll-film color transparency films are now the new E-2 Ektachrome, Daylight, and Type F. These films have the same rated speed and other characteristics already described in connection with the 35-mm E-2 Ektachrome. E-2 Ektachrome roll film is supplied in the 120 and 620 spoolings only.

Ansco Color Transparency Films in Rolls:

All Ansco color roll films now have the new Anscochrome emulsion. Thus far, only Anscochrome Daylight (rated at ASA 32) is being supplied, although a Type F roll film has been announced. Anscochrome roll films are now supplied in 120 and 620 spoolings.

Kodak Color Transparency Sheet Films:

As of this writing, only the old E-1 Ektachrome is being supplied in sheet-film sizes. Daylight E-1 Ektachrome is rated at ASA 8. The tungsten version of E-1 Ektachrome is Type B, balanced for 3,200 K professional studio lights, and rated at ASA 10. These films must be processed in standard "E-1 Process" Ektachrome kits.

Kodak Negative Color Films:

Eastman now makes two color-negative materials which should assume new importance with the recent release of the new Kodak color-print materials for home use. The two films are Kodacolor, which, up to now, has been processed only by Eastman, and Ektacolor, which is a consumer-processed material.

Kodacolor is (or, at least it *was* when we went to press) made in a Daylight and a Type A tungsten emulsion. The Daylight emulsion is rated at ASA 25, the Type A at 20. Whether the Type A is doomed to discontinuation in favor of a Type F emulsion is a matter for conjecture. Kodacolor Daylight and Type A are available in 127, 120, 620, 116, 616, and 828.

Kodak Ektacolor Daylight and Type A roll films are available in the same spooling line-up as Kodacolor. The Daylight film is rated at ASA 25, the tungsten Type A at 20. In sheet film there is no daylight Ektacolor, only a Type B film balanced for professional studio lamps which burn at 3,200 K. Type B Ektacolor is rated at ASA 8.

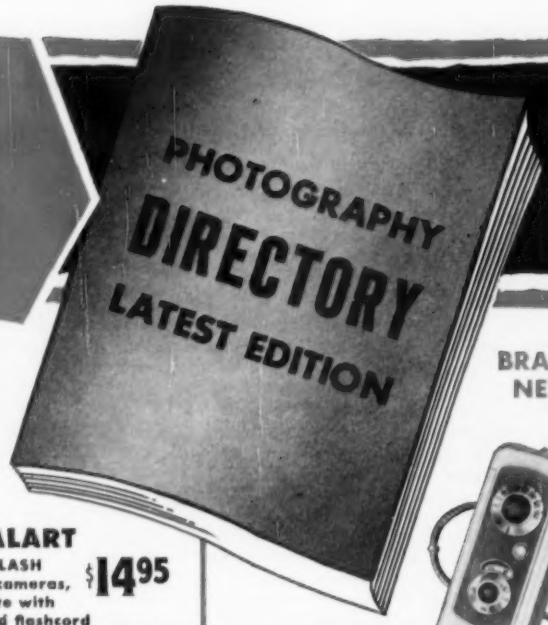
Kodak Black-and-White Films: 35-mm and Roll-film Sizes:

The most recent change in Kodak roll-film and 35-mm black-and-white emulsions was the discontinuation of Super-XX. Where high film speed is required, Kodak recommends Tri-X, which is rated at ASA 200 for daylight and 160 tungsten. Tri-X is available in 35-mm and 127, 120, and 620 roll-film spoolings.

When Super-XX was discontinued, Kodak announced that its Plus-X emulsion was being improved—higher speed without any change in the grain structure. The new Plus-X is rated at 80 for daylight, 64 for tungsten. (The old Plus-X was rated at ASA 50 daylight, 40 tungsten.) Plus-X is now available in 35-mm and the following roll-film spoolings: 127, 120, 620, 116, 616, and 122.

When present stocks of the familiar yellow-and-brown Plus-X film boxes have been exhausted, the new Plus-X will be packaged in yellow-and-magenta cartons. For the time being much of the new roll-film Plus-X is being supplied in the old yellow-and-brown boxes. It is therefore necessary to check the instruction sheet packed with each roll to determine

FREE!



EXPOSURE METERS

BRAND NEW DEM. MODELS

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G. E. D. W. 68, reg. 24.50	18.25
G. E. PR—1, reg. 32.50	23.75
NORWOOD DIR, reg. 32.95	23.95
NORWOOD M3, reg. 16.95	12.75
SIXTOMAT X-3, reg. 29.95	19.25
WESTON MASTER II, reg. 29.95	22.95
SEKONIC with case & chain	7.50

IKOFLEX IIA

SAVE $99.00

Zeiss Tessar 3.5 ctd. sync. Discontinued Model.

Reg. $176.00.

$77.00 BRAND NEW

PRAKTICA FX

Tessar F:2.8 pre-set

Reg. $159.00. BRAND NEW

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FREE! German Flashgun

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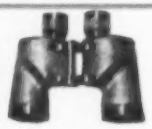

6x30 center focus	17.35
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all coated, liteweight, shock-proof. Add 10% Fed. Exc. Tax

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SAVE $55.55

- 2 ¼x2 ¼ Reflex, Autom. Filmtransport
- F:3.5 coated Lens
- Synchro shutter, 1—1/300
- Built-in selftimer
- Direct sports finder

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BRAND NEW $43.95

VOIGTLANDER VITO II

- Color-Skopar F:3.5 ctd.
- Prontor 'X' Synchro Shutter

Reg. $54.50 ..... $28.50

BRAND NEW

SAVE $20.00 SUPER RICOHFLEX

- 2 ¼x2 ¼ Reflex
- F:3.5 coated lens
- full synchro shutter
- all metal construction
- chrome satin finish

Was $49.95

BRAND NEW $29.95

Ricoh "35"

complete with case & flash

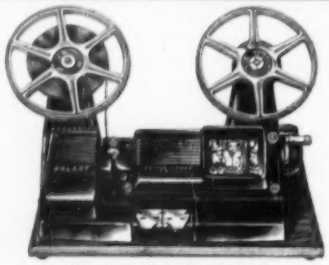
- F:3.5 coated lens
- automatic rapid filmwind
- coupled rangefinder
- synchro shutter

complete outfit BRAND NEW $59.95

KALART

B. C. FLASH for all cameras, complete with bracket and flashcord

$14.95



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complete outfit, with splicer, viewer and rewinds 400 feet capacity, folds flat BRAND NEW $39.50

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4x5 Crown F:4.7 Rfdr. brand new $163.00

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2¼x3¼ F:4.5 Lens	81.95
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Linhof 23, 3 lenses	312.50
Linhof 45, F:4.5	198.00
5" Xenon F:2, barrel	24.00
2x3 Graflex magazine	9.50
3x4 Graflex magazine	12.50

KINE EXAKTA VX

BRAND NEW

Tessar F:3.5	127.00
Biotar F:2 ctd	169.00
Rfdr. Prism	29.95
Bellowscope	13.95
Exa. F:2.9, used	41.50
28mm Retrofocus F:3.5 W.A. LN.	$68.95
35mm Retrofocus F:2.5 W.A. LN.	56.50
40mm Cassaron F:3.5 W.A. LN.	24.00
80mm Tessar F:2.8 pre-set, New	68.00
125mm Xenon F:2. LN.	49.00
135mm Sun F:3.8, Tele., New	29.00
135mm Tele-Picon F:3.5 pre-set, New	49.50
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250mm Tele-Picon F:5.5 pre-set, New	81.50
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4" Cooke F:2.2 tele-lens $84.50

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3 section, pan-head geared center post

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With lift-up center post $9.95

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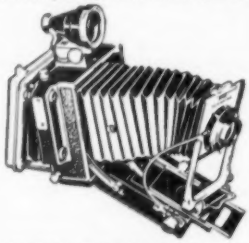
MINOX III-S CAMERA

WORLD'S SMALLEST PRECISION CAMERA with Leather Case and Carrying Chain BRAND NEW $139.50

Linhof

SUPER TECHNIKA 23

With 105 m/m Xenar f:3.5 Lens in Synchro MX Compur Rapid Shutter.... $399.70



SUPER TECHNIKA 45

45 with 127 m/m Press-Xenar f4.7 In Synchro MX Compur Rapid.... $394.70

LINHOF-Tested Lenses

for Model 23	
65 m/m Angulon f:6.8 w.a.	$64.95
105 m/m Xenotar f:2.8	169.50
105 m/m Tessar f:3.5	93.00
180 m/m Tele-Xenar f:5.5	99.50
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90 m/m Angulon f:6.8 w.a.	$74.95
150 m/m Xenar f:4.5	89.95
150 m/m Convertible Symmar f:5.6	129.50
150 m/m Xenotar f:2.8	299.50
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270 m/m Tele-Xenar f:5.5	149.95
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SAVE $24.55 BOLSEY B THREESOME

with case and flash BRAND NEW $29.95

BOLSEY C, with case & flash..... $49.75

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Kodak Retina IIC, F:2.8 MX...	139.00	83.00
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Leica IIIF, Elmar F:3.5.....	237.00	126.95
Leica IIIF, Summicron F:2.....	336.00	171.50
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Stereo Realist, F:3.5 Rfdr....	159.00	63.95
Voigtlander Prominent F:1.5..	270.00	135.95
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Just arrived! GERMAN MINILUX, automatic Exposure meter. $24.50 value, BRAND NEW **$9.95**

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21mm Biogon F:4.5 W.A. 90°	249.00	148.95
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35mm Elmar F:3.5 W.A.....	.....	42.50
35mm Summaron F:3.5 W.A..	96.00	57.25
35mm Nikkor F:3.5 W.A.....	97.50	58.50
35mm Biogon F:2.8 W.A.....	.....	78.50
50mm Nikkor F:1.4.....	199.50	96.50
50 mm Summitar F:2.....	88.00	61.95
85mm Canon F:1.5 ctd.....	238.00	114.00
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AO 500W autom, case.....	74.50	43.50
Brumberger 200W, autom, case	34.95	.....
Brumberger 2 ¼x2 ¼ & 35	39.95	.....
LaBelle 55, autom, 500W...	79.50	46.95
Revere 444, 300W, case....	69.50	28.50
Revere 888, 500W autom, case	119.50	68.50
TDC 'Headliner' 300W, Selec.	49.99	21.50
TDC deluxe 'D' 300W, Selec.	67.50	31.50
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Kodak Chevron, F3.5 Rfdr...	198.50	119.00
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Mamiya flex Auto, F:3.5 ctd..	68.00	.....
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Rolleiflex Auto, Tessar F:3.5..	.....	86.95
Rolleiflex Auto, Xenar F:3.5..	.....	74.95
Rolleiflex Standard, Tess. F:3.5	.....	49.00
Super Ikonta A, Tess 3.5.....	99.00	43.50
Super Ikonta B, Tess 2.8.....	139.00	63.75
Super Ikonta BX, Tess 2.8....	163.00	79.00
Super Ikonta C, Tess 3.5.....	114.00	59.00
Voigtlander Bessa II, Heliar 3.5	164.50	68.50
16mm MOVIE CAMERAS & PROJECTORS		
B & H Autoload, Mag. F:2.5..	174.95	88.50
B & H 70D, Turret, F:1.9.....	.....	118.00
B & H 70DL, Turret F:1.9....	365.00	218.00
B & H 70DR, F1.9, latest....	385.50	.....
Cine Kodak Mag 16, F1.9....	.....	84.95
Cine Kodak Model 'K' F1.9..	.....	62.00
Cine Kodak K100, F1.9.....	269.00	188.00
Cine Kodak Royal, F1.9.....	169.50	94.00
Keystone K50 Mag. F:2.5....	129.50	62.00
Mansfield F:2.5, 100'.....	39.50	.....
Pathe Super 16, F:1.9.....	511.00	218.00
Revere Mag. 16, F:1.9.....	182.50	68.00
Victor III, F:2.5, 100'.....	.....	34.00
Victor IV, Turret W.3 lenses..	278.00	94.50
Vistascope 16mm.....	125.00	72.00
B & H Diplomat 750W case..	299.85	169.00
Keystone K161, splicer, case..	159.50	74.95
Kodascope Royal, 1000W...	240.00	144.00
Revere 48, 750W.....	160.00	89.00
R.C.A. Jr. sound proj.....	450.00	228.00
R.C.A. Model 40, Sound.....	520.00	108.00
B & H 285C, Sound.....	449.95	249.00
B & H 202C, magnetic sound.	719.50	444.00
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B & H 220, 10mm F:2.5.....	49.95	24.75
B & H Companion F:2.5.....	79.95	38.50
B & H 134 TA, Tri-lens F2.5..	129.95	67.55
B & H Mag. 172-B F:1.9....	164.95	89.00
Cine Kodak Model 25, F2.7..	.....	21.50
Cine Kodak Mag. F1.9.....	149.50	86.90
Cine Kodak Brownie F:2.7...	37.50	19.50
DeJur Citation, F:2.5.....	77.50	34.50
DeJur Fadematic, Mag. F:2.5.	127.50	52.75
Revere 88, F:2.5.....	74.50	31.50
Revere Mag. F:2.5.....	112.50	48.00
Revere 80, F:2.5.....	97.00	42.50
Revere 84, Turret, F:2.5.....	122.50	46.00
Vistascope 8mm.....	75.00	44.00
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B & H 253 'Monterey' 500W.	79.95	46.50
B & H 'Regent' 500W. case..	179.95	91.50
DeJur 750, case.....	159.50	73.50
Keystone K 100 latest, case..	99.50	56.75
Keystone K95M, wide-field...	124.50	66.50
Keystone K 109, splicer, case.	159.50	74.95
Kodak Brownie, case.....	62.00	37.50
Revere 85, 500W, case.....	124.50	86.25

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Bolex C-8, F:2.5..... 86.75
B-8 2-lens Turret F:2.8 67.95
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whether or not it's the new or the old emulsion. Plus-X instruction sheets indicating a daylight index of 80 and 64 for tungsten identify the new emulsion.

In addition to the discontinuation of Super-XX and the improvement of Plus-X, Kodak has resurrected and improved the grain and resolution of its old-time fine-grain favorite, Panatomic-X. The new Panatomic-X is rated at ASA 25 daylight and 20 tungsten. It will shortly be made available in 35-mm cassettes. Whether or not Kodak intends to spool Panatomic-X in roll-film sizes is not now certain.

Kodak makes one orthochromatic roll film, Verichrome, which is rated at ASA 64 in daylight, 32 tungsten. It is supplied in all roll-film spoolings.

Ansco 35-mm Roll-film Black-and-White Materials

The most recent change in the Ansco black-and-white roll-film line-up occurred last spring when their new All-Weather Pan (rated at 64 daylight, 50 tungsten) was introduced. All-Weather Pan is a panchromatic emulsion incorporating an unusual degree of exposure and development latitude to accommodate users of simple cameras who rely upon drug-store processing. Incidentally, Ansco has definitely not discontinued its orthochromatic roll film, Plenachrome, which is rated at 50 daylight and 25 tungsten.

The other two Ansco roll films are Supreme, which is rated at ASA 64 for daylight and 50 for tungsten, and Superpan Press, which is rated at 125 daylight, 80 tungsten. Both are panchromatic and are available in 127, 120, 620, 116, and 616 spoolings.

In 35-mm, Ansco currently supplies two panchromatic films: Supreme, which has the same nominal characteristics as the roll-film version, and Ultra Speed Pan, which is rated at 100 daylight and 80 tungsten.

Kodak Film Packs:

The situation in Kodak film packs exactly parallels the roll-film situation. Super-XX film packs have been completely discontinued. Only the new ASA 80 Plus-X and the very fast ASA 200 Tri-X films are now being supplied in the following film-pack sizes: 2¼ x 3¼, 3¼ x 4¼, 3½ x 4¾, and 4 x 5. Kodak film-pack materials have the same specifications and characteristics as Kodak roll films of the same name.

Kodak Sheet Films:

Biggest source of confusion in the Kodak sheet-film picture is the future availability of Super-XX sheet-film sizes. The official word received just prior to publication is that Super-XX sheet film is here to stay, and no plans to discontinue it are in the works. Actually, Super-XX sheet film is a very much different emulsion from the 35-mm roll-film and film-pack Super-XX which was recently discontinued. In the latter formats, Super-XX was the fast film upon which one relied when high emulsion speed was more important than grain or other quality considerations. And, of course, the introduction of Tri-X more or less obviated this need. In sheet film, however, the speed films are Royal Pan (rated ASA 200, daylight, 160 tungsten) and, before that, Super Panchro-Press Type B (rated ASA 125 daylight, 100 tungsten). And, the real role of Super-XX sheet film is, and has always been, that of a high-quality, fine-grain emulsion for applications requiring low over-all negative contrast.

A second cause of confusion is Tri-X sheet film. This film, which is rated at 200 daylight, 160 tungsten, is in no way related to the Tri-X of 35-mm roll-film and film-pack frame. Tri-X sheet film is a Type C panchromatic material especially designed to yield increased red sensitivity, whereas the Tri-X 35-mm, roll-film, and film-pack emulsions feature higher green and lower red sensitivity. The latter are more closely related to Royal Pan sheet film in all of their photographic characteristics.

Kodak makes a total of 15 different black-and-white sheet films which you will find listed on pages 152-53 of the *1955 Popular Photography Directory*.

Ansco Sheet Films:

There have been no recent changes in the Ansco black-and-white sheet-film line-up. Ansco continues to make a total of eight black-and-white sheet films including such films as Triple S Pan, which is rated at 200 daylight, 160 tungsten, and their very famous Isopan fine-grain emulsion, which is rated at 50 and 32 for daylight and tungsten. The Ansco roster will be found on page 151 of our *1955 Directory*.

The Polaroid Black-and-White Films:

With the recent advent of Polaroid Professional Pan film (Type 43), there are now four black-and-white films available for making 60-second prints with the various Polaroid-Land one-step cameras. There is an ortho material (Type 31 and Type 41) with a daylight speed of 100 and two additional panchromatic materials, Polapan 200 (Types 32 and 42) and Polapan 400 (Type 44) with respective daylight speeds of 200 and 400. These all come with a paper-base negative, whereas the Type 43 material comes with a translucent plastic-base negative that produces a paper print of extremely high inherent resolution. The Type 43 material has a daylight speed of 200. Polaroid films in the "30" series produce 2¾ x 3½-inch prints in the Polaroid Highlander camera, whereas the "40" series films produce 3¼ x 4¼-inch prints in the Polaroid Speedliner, Pathfinder, and Model 700 cameras. In no case can the negatives be used for making extra prints.—

new books

PHOTOGRAPHY FOR THE TRAVELER, by Don D. Nibbelink, revised by Mel Fauer. Published by Crown Publishers, Inc., 419 Fourth Ave., New York 16, N. Y. Paper bound, 5 x 7, illustrated, 110 pages, $1.00.

This book gives practical advice to the photographer while traveling. It includes information on equipment selection and care, custom regulations, processing facilities throughout the world, and an exposure guide for all land, sea, and air conditions.

PRINTING WITH "VARIGAM," by M. Richard Marx. Published by Camera Craft Publishing Company, 95 Minna St., San Francisco 5, Calif. Paper bound, 5¾ x 8½, illustrated, 84 pages, $1.95.

The author explains how Varigam and other variable-contrast papers work, describes simple and advanced techniques, and tells how Varigam differs from graded printing papers. A short history of the development of Varigam, written by Rowland S. Potter, is presented in the foreword.

CAMERA ADVENTURING ON MT. RAINIER, The Northwest Adventure Series, photographs by Bob and Ira Spring, text by Norma and Patricia Spring. Published by Superior Publishing Co., 2809 Third Ave., Seattle 11, Wash. Paper bound, 6½ x 9, illustrated, $2.90.

The Spring brothers and their wives present a travelogue and specific photographic information on Mt. Rainier in the first book of the Northwest Adventure Series.

A TINY BABY FOR YOU, text by Nancy Langstaff, photographs by Suzanne Szasz. Published by Harcourt Brace and Company, 383 Madison Ave., New York 17, N. Y. Cloth bound, 6¾ x 8⅜, illustrated, 33 pages, $2.50.

This book is intended for the small child who awaits his first brother or sister. It presents simple text and fine photographs to explain how he will share in the family's new happiness.

HOW TO PHOTOGRAPH YOUR CHILD, by Tana Hoban. Published by Crown Publishers, Inc., 419 Fourth Ave., New York 16, N. Y. Paper bound, 5 x 7, illustrated, 128 pages, $1.00.

One of the top photographers of children presents a concise handbook on how the amateur photographer can get the best results in his attempts to photograph youngsters. Tana Hoban's advice on equipment, posing, lighting, composition, color, and darkroom work is accompanied by a generous portfolio of her own favorite photographs, including several of her own daughter.

GUIDE TO RETOUCHING NEGATIVES AND PRINTS, by Kitty West. Published by Greenberg: Publisher, 201 E. 57th St., New York 22, N. Y. Paper bound, 4¾ x 7¾, illustrated, 121 pages, $1.95.

A practical handbook on the newest methods of retouching. The author includes chapters on the necessary equipment, preparation, actual steps in retouching both prints and negatives, reducing density, portraiture, and blocking out backgrounds.—

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Leica M-3 Body	288.00
Leica IF body, built-in flash	64.80
Leica IIF body, built-in flash	120.00
Leica IIIF body, built-in flash	180.00
Leica IIF with f/3.5 Elmar	177.00
Leica IIIF with f/2 Summicron	336.00

	M-3	Standard
35mm Summaron f/3.5	$ 99.00	$ 96.00
Fuji 35mm f/2 W.A.		179.50
Fuji 50mm f/1.2		299.50
50mm Elmar, ctd. f/3.5	60.00	57.00
50mm Summarit, f/1.5	180.00	177.00
50mm Summicron f/2	159.00	156.00
85mm Summarex, f/1.5, Chrome		360.00
90mm Elmar f/4, Chrome	93.00	90.00
90mm Elmar f/4, Collaps. mt.	150.00	
125mm Hektor, f/2.5		147.00
135mm Hektor, Chrm., f/4.5	141.00	135.00
135mm Hektor sht. mtd.	121.50	120.00
Leica Meter	30.00	17.50
200mm Telyt f/4.5		156.00
400mm Telyt, f/5		450.00
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Size	Coated Lens in Shutter	Speed Graphic	Crown Graphic
2¼ x 3¼	101mm Ektar f/4.5 (1/800 sec.)	$338	$300
	105mm Tessar f/3.5	355	306
	105mm Ektar f/3.7	343	294
4 x 5	127mm Ektar f/4.7	354	305
	135mm Schneider Xenar f/4.7	337	291
	135mm Schneider Xenar f/3.8	388	344
	135mm Optar f/4.7	354	305
	135mm Tessar f/4.5	370	326
	150mm Schneider Xenar f/4.5	381	334
	150mm Tessar f/4.5	381	334
	150mm Tessar f/3.5	448	400
	150mm Schneider Xenotar f/2.8	568	524
	152mm Ektar f/4.5	371	327

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CONTAX IIA or IIIA—your Contax IIA or IIIA X Sync and $69.50
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New VX Exakta w. f/2.8 Preset Tessar		$179.00
New VX Exakta with f/3.5 Tessar lens		149.00
Exakta penta prism w/rf	85.00	38.95
Praktica FX f/1.9 preset Primoplan	159.50	78.95
Flexaret Synch. f/3.5	99.50	48.95
Ditto Camera f/3.5	99.50	48.00
Rolleicord IV with f/3.5 lens		98.50
105mm Ditto Telephoto	39.50	29.95
Bolsey B2 f/3.2 lens	56.50	39.95
Bolsey B2 f/3.2 with case and flash	69.50	45.95
Bolsey C reflex f/3.2 lens	89.50	48.50
Bolsey C f/3.2 with case and flash		59.95
Contax IIA f/2 X synch.	336.00	228.00
Contax IIIA f/1.5 X synch.	412.00	298.00
Super Ikonta A f/3.5 Tessar X synch.	99.00	69.00
Super Ikonta B f/2.8 Tessar X synch.	139.00	99.00
Nikon 1954 model, w. f/1.4 Nikkor	299.50	189.00
Robot Star f/1.9 lens	249.00	99.00

CONTAX D

Contax D w. f/2.8 preset Tessar	$94.95
Contax D w. f/2 preset Zeiss	$124.95
Eveready case	$ 12.00
Macro-Kilar 40mm Model D, foc. infinity to 2"—f/3.5	$114.95
Model E, same as above, inf. to 4"	
135mm Albinar f/4.5	$29.95

PRAKTICA

Praktica FX f/1.9 preset Meyer	$78.95
Praktica FX f/2.8 preset Tessar	$78.95
Case	8.95

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RETINA IIC, Xenon f2/8 lens $139.50

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Hasselblad Bellows for close-up work	$115.00
Lenses:	
135mm Ektar lens f/3.5	$285.00
250mm Sonnar f/5.6	$299.50
250mm Sonnar f/4	$389.00
Zeiss W.A. Distagon f/5.6, with case	$189.50

1956 ROLLEIFLEX AND ROLLEICORD

w. Tessar f/3.5 lens	$232.50
w. Xenar f/3.5 lens	217.50
Rolleiflex w. Schneider Xenotar f/2.8 lens or w. Zeiss Planar lens f/2.8	$291.50
Rolleicord V w. Xenar f/3.5 lens, full synch. light value	$134.55
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Same as above, with 105mm f/2.8 Xenotar, W.A. and Telephoto $663.70

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Bolex H-8 Leader with Lytar coated f/1.9 lens	$259.50
Bolex H-8 De Luxe with Switar coated f/1.5 lens	$438.25
Bolex H-16 Leader with Lytar coated f/1.9 lens	$269.50
Bolex H-16 Supreme w/Lytar coated f/1.9 lens	$394.00
Bolex H-16 Supreme w/Switar coated f/1.4 lens	$510.00
Bolex H-16 Supreme with Switar coated 1.4 lens, Switar 16mm coated f/1.8 lens, Switar 50mm coated f/1.4 lens and deluxe H-1 case complete	$779.00
Bolex C-8 w/Lytar ctd. f/2.5 lens	$ 89.95
Bolex C-8 w/Lytar ctd. f/1.9 lens	129.95
Bolex B-8 w/Tyar ctd. f/2.8 lens	119.50
Bolex B-8 w/Lytar ctd. f/1.9 lens	149.50
Bolex B-8 w/Switar ctd. f/1.5 lens and Tyar 1½" (telephoto ctd. f/2.8 lens)	$274.50
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Bolex Rockover	27.50
Bolex M-8 Projector with case	169.50
Bolex G-8mm-16mm Projector	339.50
Pan Cinor Zoom coated f/2.8 lens (for 8mm)	$219.50
Pan Cinor Zoom coated f/2.8 lens (for 16mm)	$349.50
Pan Cinor w/case 17½ to 70mm thru lens view	$449.50
Switar 16mm f/1.8 w/a	99.50
Switar 50mm f/1.4	168.00

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ALPA VII 35mm Reflex

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- Built in Multifocal viewfinder
- Prism reflex and rangefinder focusing
- Single knob for winding and shutter setting
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28mm Retrofocus f/3.5 W.A.	$139.00
38mm Old Delft f/3.5 W.A.	89.00
40mm Macro-Kilar f/3.5	89.00
135mm Old Delft f/3.2 tele.	129.00
180mm Old Delft f/4.5 tele.	149.00
300mm Tele-Kilar f/5.6 tele.	179.00

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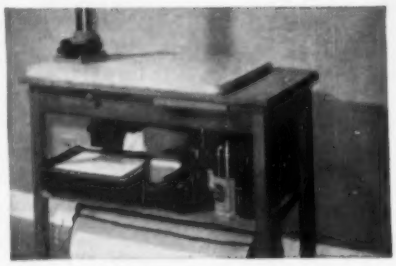
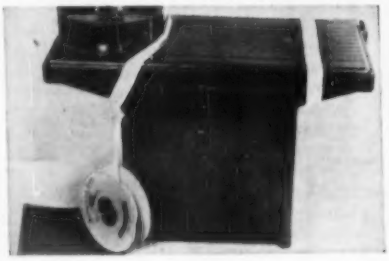
Compact Darkroom Facilities



For the photographer who has a problem of limited space, a typewriter table such as that illustrated here will supply compact darkroom facilities. Top of table accommodates enlarger, and print dryer occupies floor space beneath shelf which holds trays, chemicals, safelight, and other items. Easy-rolling casters provide smooth portability. Entire unit can be stored in a closet and moved to bathroom or kitchen for printing jobs.—*Marshall Lincoln, Ft. Wayne, Ind.*

No Accidental Exposure of Film



On those occasions when you load sheet film into a tank but can't get around to developing it for a few days, there's always the possibility of the tank being opened accidentally, with resultant exposure of the film. The use of adhesive tape, in the manner shown in the accompanying photograph, will guard against that possibility by holding the tank cover firmly in place until such time as you can proceed with the developing.—*H. Leeper, Canton, Ohio.*

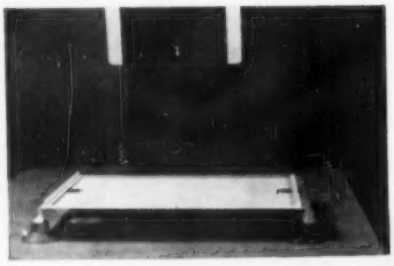
Keep Developing Reel Clean

Sticking and jamming of roll film when being inserted in the plastics reel of a developing tank may be caused by deposit of lime and other minerals left on the reel by evaporation of water. An easy remedy for this condition is using a small quantity of toothpaste, applied with cotton wrapped around a toothpick, to clean the grooves from beginning to end, then rinsing thoroughly. This leaves the grooves smooth and polished.—*Ken Murray, Colon, Michigan.*

Base for Clamp-on Reflector

An old electric iron, with handle in good condition, will serve admirably in the capacity of base for a clamp-on reflector, as illustrated in the accompanying photograph. The iron is tip-proof and stands solidly, and because of its size and shape it is usable in limited space. It can be moved about easily, as required, and can be placed advantageously for either background lighting purposes or for table tops.—*Robert W. Smith, Malden, Massachusetts.*

To Hold Easel Steady



Four small, rubber suction cups, glued securely to the base of a light-weight easel—one cup at each corner—will greatly minimize the danger of having the easel slide or move when in use. This will be found particularly helpful when it's necessary to make a number of identical prints and the easel must remain in place to assure uniformity of prints. Pressed firmly to base of enlarger, as shown here, suction cups hold easel in position.—*F. M. Pease, El Paso, Tex.*

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Exakta VX—Latest 1956—$44.50—plus your old Exakta VX (Body for Body)
Retina IIIC—Latest Model—$74.50—plus your Retina IIA
Contax IIA & IIIA—Latest 1955—$66.50—IIA for IIA or IIA for IIIA (Body for Body)
Rolleiflex, Rolleicord V—$63.00—plus your Rolleiflex MX—$45.50—plus your Rolleicord IV
Leica M-3—$117.50—plus your Leica IIIF (Self Timer)
Nikon S-2—Latest Model—$105.50—plus your Nikon S (Body for Body)
Exakta VX—$46.50—plus your Exakta V
Exakta VX—$80.50—plus your Exakta I or II
Exakta VX—$29.50—plus your Leica IIIF
Exakta VX—$28.50—plus your Contax IIA
Leica IIIF—$56.50—plus your Leica IIIC
Rolleiflex 2.8C—$116.50—plus your Rolleiflex MX
Rolleiflex 2.8B—$75.50—plus your Rolleiflex 2.8C
Retina IIIC—$75.50—plus your Contessa
Nikons S-2—$66.50—plus your Contax IIA
Contaflex II—$67.50—plus your Contaflex I
Contaflex I—$35.50—plus your Contessa
Auto Biotar Lens—$61.50—plus your Biotar Pro-Set
Exakta VX—$54.50—plus your Contax D
Exakta VX—$85.00—plus your Contax II or III
Exakta FX—$86.00—plus your Praktica FX
1955 Exa MX—$33.50—plus your Argus C-3
1955 Exa MX—$24.50—plus your Argus C-4
1955 Exa MX—$36.50—plus your Rada 35 RF
1955 Exa MX—$39.50—plus your Bolsey B2
1955 Exa MX—$25.50—plus your Kodak Signet
Contax IIIA—$44.50—plus your Contax IIA
Revere 888 Projector—$66.50—plus your Revere 446
Retina IIIC—$94.50—plus your Vitessa MX
Nikon S-2—$144.50—plus your Retina IIA
Nikon S-2—$56.80—plus your Leica IIIF
Nikon S-2—$54.50—plus your Contax IIIA
Nikon S-2—$113.50—plus your Rolleiflex MX
f1.4 Nikkor—$65.00—plus your f1.5 Sonnar
f1.4 Nikkor—$85.50—plus your f2 Sonnar
Contaflex I—$34.50—plus your Retina IIA

35MM CAMERAS

	New	Used
Canon IV S2 f1.8 Serenar	$284.00	$124.50
Contax I f2.8 Tessar		42.50
Contax II f2 Sonnar		78.95
Contax III f2 Sonnar		98.00
Contax IIA f1.5 Sonnar	374.00	159.50
Contax IIIA f2 Sonnar	383.00	179.50
Contax IIIA f1.5 Sonnar	412.00	174.50
Leica IIIC, f3.5 Elmar		79.50
Leica IIIC f2 Summitar		99.50
Leica IIIF f2 Summicron	326.00	169.00
Leica IIIF f1.5 Summarit	357.00	181.50
Leica M3 f2 Summicron	447.00	257.50
Nikon S2 Nikkor f2	269.00	109.50
Nikon S2 Nikkor f1.4	299.95	149.50
Rectaflex f2 Xenon	250.00	119.95
Bolsey B2 RF	68.50	22.50
Bolsey C22 f3.2 Reflex	99.50	42.50
Kodak Flash Bantam f4.5	56.00	22.50
Kodak Pony B28 f4.5	29.50	14.75
Retina IC	190.00	119.50
Kodak Bantam Special f2 Xenon	185.00	99.50
Kodak Town & Country f3.5	75.00	44.50
Minox III,5 Chain and Case	139.50	79.50
Minox III	129.50	90.00
Robot II Biotar f2	127.50	49.50
Voigtlander Prominent f2	175.00	125.00
Voigtlander Prominent f1.5	199.50	149.50
Voigtlander Vitessa f2	127.50	72.50

SLIDE PROJECTORS

	New	Used
Argus Automatic 300 Watt & Case	66.50	34.50
Argus PB300 & Case	46.50	24.50
Rodeside Merit 150 Watt	30.10	15.95
Rodeside Signet 300 Watt	56.50	33.00
Rodeside Signet 500 Watt	72.50	46.00
La Belle 55 Automatic	95.00	49.50
Nord Stereo 300 Watt	99.50	99.00
Revere 444 300 Watt	69.50	29.00
Revere 555 500 Watt	79.50	44.50
Revere 888 500 Watt	119.50	94.50
Viewlex Project-O-Matic	59.95	32.95
TOC Headliner 300 Watt	59.50	27.00
TOC Model D	67.50	34.00
TOC Duo 300 Watt	67.50	34.40
TOC Duo 500 Watt	84.50	49.95
TOC Projector View 200 Watt	77.50	39.95
TOC Stereo Projector 500 Watt	169.50	79.50
TOC Stereo Projector View	144.50	79.50

16MM PROJECTORS

	New	Used
Ampro Imperial	299.50	105.00
Bolex GB-16	339.50	225.00
Bell & Howell 271A Statesman	199.95	99.95
Bell & Howell 179 Diplomat	299.95	139.50
Keystone A82	139.50	64.50
Keystone K101	159.50	75.00
Revere 48	180.00	75.00
Robescopa Royal	240.00	99.50
Ampro Stylist	419.95	250.00
Ampro Premier	579.00	350.00
Bell & Howell 285C	449.95	199.50
Bell & Howell 285B1	514.95	239.00
Bell & Howell 202C	699.00	295.00
Revere SP 16	325.00	129.00

8MM PROJECTORS

	New	Used
Ampro Futurist	149.95	79.50
Bell & Howell Monterey	79.95	47.50
Bell & Howell Regent	179.95	92.50
Bolex M 500	169.50	99.50
Dejur 750	159.50	69.50
Dejur 1000	177.50	79.50
Keystone K70C Bright Beam	89.95	44.00
Keystone K105	159.50	75.00
Keystone K100	99.95	64.00
Keystone K95M	127.95	79.00
Keystone K109M	167.50	87.00
Kodak Brownie 300	62.00	37.50
Revere 85 Deluxe	124.50	49.50

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CHOOSE YOUR COMBINATION	Exakta VX	Pentacon	Exa	Praktica	Alpa 7
Automatic Westenar f2.8	$139.50	$109.50	$ 84.50	$ 74.50	—
Automatic Tessar f2.8	179.50	—	112.50	—	—
Automatic Westagon f7	184.50	129.50	104.50	129.50	—
Automatic Biotar f2	244.50	—	150.00	—	—
Automatic Xenon f1.9	246.50	202.50	164.50	184.50	$304.50

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Brand new. Also known as Contax D, Pentacon, Hexagon, etc. Penta-prism. Shutter to 1/1000. 50mm f2.8 Zeiss Tessar Pre-Set.

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With 58mm Zeiss Biotar f2 Pre-Set $110.95
55MM f2 Steinheil Quinar Automatic 199.95
50mm f1.9 Schneider Xenon Automatic 214.95
Complete Price Lists of Super D's with other lenses and complete accessories, available free.

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35mm single lens reflex. Focal plane shutter, 12 sec. to 1/1000 sec. speeds. Select any Exakta lens. Body only.

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With 50mm f2.8 lens $136.95
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With 50mm Angenieux f1.5 Pre-Set 199.50
With 50mm Zeiss Tessar f2.8 Pre-Set 179.50
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PRAKTICA FX

Famous 35mm single lens reflex with focal-plane shutter, interchangeable lenses. With f2.8 Tessar Pre-Set.

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Single lens reflex uses all Exakta lenses and access. With 50mm Zeiss Tessar and 100mm f4.5 Telephoto Lens.

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ARGUS C-4 CAMERA

35mm camera with f2.8 coated lens, coupled rangefinder, built-in flash synchronization. List price $85.50. Used

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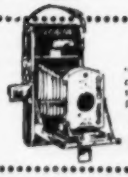
POLAROID 95



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With 15mm f2.3 Wide Angle Lens, 1" f1.9 Normal lens and 3" f3.5 Telephoto lens complete. USED

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	Used	172.80	268.20	280.80	347.70	191.70	221.70	194.70	208.80
LEICA IIIF	NEW	180.00	336.00	357.00	499.00	239.00	289.50	249.00	237.00
	Used	108.00	201.60	214.20	299.40	143.40	173.70	149.40	142.20
CANON	NEW	164.00	249.50	269.00	464.00	219.50	264.00	224.50	169.50
	Used	98.40	149.70	161.40	278.40	131.70	158.40	134.70	101.70
NIKON	NEW	195.00	—	—	499.00	—	345.00	299.50	—
	Used	117.00	—	—	298.40	—	207.00	179.70	—
CONTAX IIA	NEW	199.00	—	—	499.00	—	289.50	254.00	—
	Used	119.40	—	—	299.40	—	173.70	152.40	—
CONTAX IIIA	NEW	237.00	—	—	540.00	—	319.00	284.00	—
	Used	142.20	—	—	324.00	—	191.40	170.40	—

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Precision 35mm Single-Lens Reflex Camera with f2.8 Coated Pre-Set Tessar Lens

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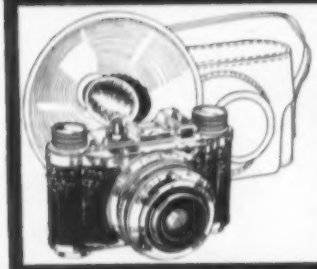

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- Built-in Flash Synchronization
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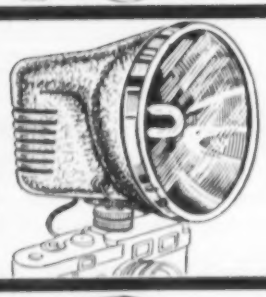

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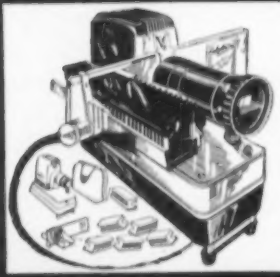

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FREE! 6 TDC SLIDE TRAYS WITH EACH OUTFIT!

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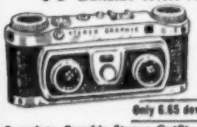

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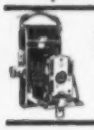

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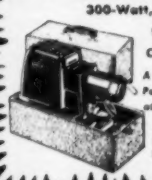

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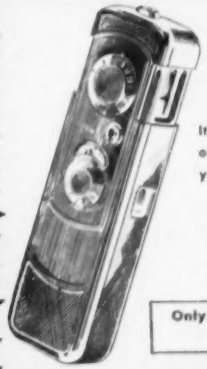

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your bounce flash

Photo left below made with unmodified bounce flash has heavy shadows, no snap. Compare with picture made with flash unit shown above. Arrow shows hole cut into side of reflector.

Probably the most popular lighting technique of the magazine fraternity is bouncelight, pointing a light source upward and letting the ceiling reflect, or bounce the light back on the subject. Reducing the extreme contrast of the usual flash-on-camera pointed directly at a subject, the effect closely approximates natural light sources, giving a soft, even illumination, without losing the natural look. However, the light from overhead results in shadows under the eyes, nose, lips, and chin. In an effort to eliminate these shadows, David Douglas Duncan, *Life* ace who made photographic history in Korea, came up with an ingenious solution to the shadow problem.

By having a hole drilled into the side of a Mighty Light speedlight reflector, Duncan is able to get two beams of light when using bouncelighting. The first is the normal upward beam directed upward and bounced down. The second is a small beam directed toward the subject from the hole in the side of the reflector. This not only serves as a fill-in, eliminating the shadows, but also gives the picture additional snap, particularly catchlights in the subject's eyes. This extra light does not affect the normal exposure or development in any way, serving only to introduce added sparkle.

A small hole, about ⅜ inch, was cut into the reflector, opposite the helix of the flashtube, letting a direct beam of light hit the subject. The result is a soft, natural-looking portrait with just that extra snap and highlights to give more bounce to bouncelight. The work was done by Speedlight Center, makers of the unit. They will supply electronic flash units with holes drilled in the side on special order.

These pictures were made by Duncan using a Leica IIIf with an f1.8 Serenar lens on Plus-X film.

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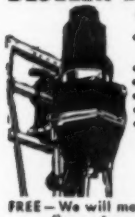

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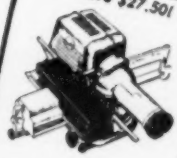

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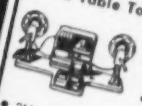

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Films for profit

By ERNST WILDI
Photographs by the author

Competent 16-mm amateur photographers can produce professional films for industry, small businesses and entertainment

Many amateur photographers are capable of producing films on a professional level for industry, small businesses, or entertainment. The better-than-average photographer can make his films pay off in dollars and cents, and should try his luck in this area of 16-mm films.

I have learned much about producing films in the last few years and would like to pass along the information. I'll proceed in a step by step basis, giving as many tips and short cuts to professional film making as I can.

Finding a customer

Basically, there are two ways in which to proceed. First, the film may be shot with an attempt made to sell it afterward. For example, perhaps while on a trip through one of our beautiful National Parks, you obtained enough excellent material with which to make a good motion picture. You now contact organizations which might be interested in such a film, the state's Department of Commerce, or perhaps a railroad or airline bringing tourists to the spot. It is always best to contact the prospective customer before the film is completely edited or the sound recorded, for the customer will undoubtedly have his own ideas about the manner in which the film is to be presented.

In the second case, a prospective buyer is sold on the idea of making a film before actual shooting begins. This may be somewhat more difficult, for many organizations are understandably reluctant to offer an assignment to a nonprofessional in the motion-picture field. Therefore, it is up to you to convince the organization that you are capable of producing good movies. Perhaps this may be accomplished more readily by showing them the best film in your library. This film should be presented under the most favorable conditions. In any case show it with sound, even if the sound, synchronized with the picture, is played on a tape recorder. Sound always helps your picture.

Making an agreement

An assignment to produce a movie should be in the form of a written agreement which includes both party's obligations as to type and length of film, the price, number of prints included in the quotation, time of payment, ownership of the original, storage of the original, in whose name it is to be copyrighted, and other points. Never undertake a film by oral agreement alone. Keep in close contact with the client throughout the entire production and have every step of photography, narration, and recording discussed and approved by him in writing.

This article deals with various costs involved in the making of a film. While it can be used as a general guide, check with your laboratories and recording studios before quoting your customer a price. Request enough to cover unexpected happenings which, despite the best laid plans, are likely to crop up and increase your costs.

Preparations for shooting

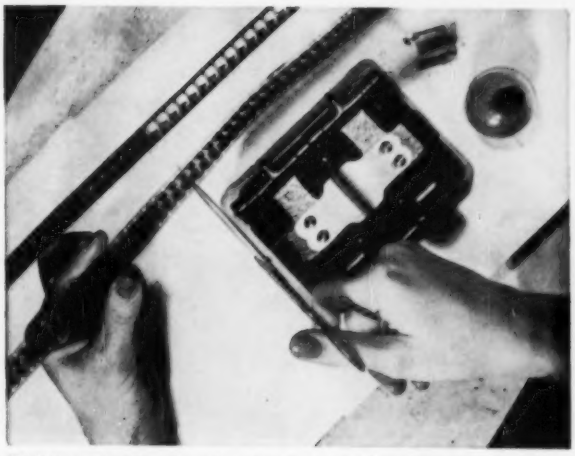
Your client will undoubtedly expect to be supplied with an outline of the film. An outline can best be compared with the chapter headings of a book. It should give a clear idea of film content without going too much into detail. If you intend to engage a professional script writer, it is good practice to consult him when preparing the outline. He will probably offer good suggestions for combining various sequences to effect a smoother narration. This outline should be approved before you start shooting or editing the film.

The shooting

A shooting script is recom- (*Continued on page* 138)

10 STEPS IN MAKING A PROFESSIONAL FILM

1 Finding a customer
2 Making an agreement
3 Preparing for shooting
4 Choosing actors
5 Shooting
6 Editing
7 Writing narration
8 Recording narration and music
9 Making duplicates
10 Getting a copyright



Editing can be done by amateurs, or given out to professional editing labs. Many labs can put fades and dissolves into films.

Professional sound studios like the Van Gelder Studio of Hackensack, New Jersey, will sell their services to the amateur.

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Fundamentals of production

CCNY MOVIE SHORT COURSE PART 3

By YAEL WOLL

Yael Woll, Instructor, Film Production, Institute of Film Techniques, College of the City of New York.

The third in a series of four "lectures" by instructors of CCNY Institute of Film Techniques.

You are producing your own film. You don't have too much experience, money, time, or equipment. You've got problems. That's all right.

Problems can be solved. When you're in the planning stage, make it easy on yourself. While you're making the film, don't quit on yourself. After the film is finished, things will pretty much take care of themselves.

To make it easier on yourself work within your limitations. Don't do what you can't, and what you can—do as well as you know how. If you do not have the technique of, or access to, motion-picture sound equipment, don't plan on a film that relies on synchronous sound. That means dialogue. Sure, you can fake it. But you'll know it's phony, and more important, so will your audience. There is much that can be done in a sound studio after the rough-out has been made. Narration can be something more than a dull droning. Use your ingenuity. And music and sound effects can be very powerful, if used properly. Think your situation out.

If you can't afford to pay good actors and your friends can't act, don't make a film that relies on acting. The world is more of a stage than we think. Much that is dramatic happens around you every day if you but train yourself to see it. Ordinary people in ordinary situations are capable of expressing truth, filmwise, more dramatically than expert actors. Draw your material from the life and atmosphere that you know best. Don't scorn the documentary, either product or technique.

Once you have decided on your over-all concept, the seemingly trivial items come to the fore. They have an unfortunate tendency—they develop into full snags when you are most vulnerable.

Prepare yourself thoroughly. Plan! Organize! Know your locations. Know how you'll get there and what equipment, down to the pencil, you'll carry with you. Know the schedules of the people who are working with you. Know what scenes you are going to shoot, and which ones are to come first.

Photographs by Alan H. Pesetsky

Team work is stressed in the teaching of film production by instructors at CCNY. Before work on a film begins, it is fully scripted and organized so little time and money are lost.

Have your shooting script clear and explicit. Know your memory is liable to fail you under pressure, and put everything down on paper. If you can't specify a shot as to angle and content, know what it must say generally, and where it will fit into the edited film. Have your budget worked out from start to finish. If you don't, your life can get exceedingly painful later on.

If there are gaps in your knowledge don't be afraid to go to the people who can help you. The large film manufacturers have special departments with trained experts who will answer your questions. The laboratories are generally very sympathetic. But try to be specific about what you want to know. Remember that people are only human. You must meet them half way.

For the actual shooting use the best raw stock (unexposed film) available. Don't fool around with cheap or outdated film. It is silly to try and save a few dollars at the risk of complete disaster. Consider that the camera on a tripod attracks people as the spider does the fly. This may impede your work. Take it into account. Use the same camera or magazine for all your shooting, so that there will be no jumping framelines. If possible, use the same brand and type of film throughout. Try to cover yourself with overlapped action on all your takes. This can save you from much costly and inconvenient reshooting.

Accord your original the respect you'd give a delicate woman. It is irreplaceable, and easily damaged. Under no conditions screen it more than once, and that with an extra-clean projector. Handle it with cotton, if not kid gloves, and don't handle it more than necessary.

Once you've got your workprint, store the original in a cool, safe place and don't touch it till the final matching. You can save money on the workprint by using cheap stock and one light, but this might give you a little trouble in value matching during the editing. Don't save on edge numbers. Get them. They pay their way. Go through your editing step by step and don't take any short cuts. First things have a funny habit of coming first.

Keep your editing clearly marked and differentiated *at all times*. Be sure that you know your rushes well before you start cutting them up. Look and keep looking at them.

But above all, don't quit on yourself. There is a great deal that is tedious and purely mechanical in all the steps involved. Errors in judgment and simple oversights hover over the film in endless profusion. Don't be discouraged; it's all worth it. There is no better way of learning in films than by going through it all yourself. Remember, it's your baby when it's finished.

Now you've got your answer print back from the lab. There are many reliable distributors who will give you a showing, and if they like it, will take the film for distribution. The percentages and royalties are generally fair. In any case you can ask around and always make your best deal.

So good luck.—

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55mm f1.9	119.85	180mm f3.5	146.25
58mm f2	59.50	200mm f2.3	168.75
75mm f1.5	99.50	240mm f5.5	93.75
75mm f1.9	97.50	250mm f5.5	93.35
80mm f2	119.95	300mm f4	329.50
80mm f2.8	112.10	300mm f5.5	104.95
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85mm f2	93.35	300mm f3.5	270.00
85mm f2.8	48.75	300mm f5.6	121.40
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90mm f1.8	112.10	400mm f4.5	270.00
90mm f3.5	85.25	400mm f5	183.75
100mm f2.8	52.40	400mm f5.5	149.50
100mm f3.5	65.25	400mm f5.6	148.95
102mm f4.5	159.85	500mm f5	206.25
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125mm f2	180.00	800mm f6.3	562.50
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New Kodak Brownie has 3-lens turret

The new Eastman Kodak Brownie 8-mm movie camera has a unique "three-lens" system which gives the amateur versatility without losing any of the simplicity of the one-lens Brownie camera. The new camera will sell for $79.50.

The design of the lens system is such that the normal lens is located in the camera body. A plain barrel, a telephoto converter, and a wide-angle converter are housed in the turret. The normal lens is changed into a telephoto or wide-angle by lifting the turret out about a quarter of an inch and rotating it until one of the desired converters fits over the normal lens. Focal lengths of the different lens combinations are: normal 13-mm; telephoto, 24-mm; and wide angle, 9-mm. All have an aperture of *f*/1.9.

Now, let's examine other features of the camera.

Aperture control: One wheel controls the aperture setting for all lenses. Once it is set, any lens can be switched into position and used as long as light conditions remain the same.

Loading: Arrows clearly indicate how the film should travel. Film slips easily onto the sprocket drive wheel.

Viewfinding: The front finder on the top of the camera has three different-colored rectangles etched into it. Each color corresponds to a color on one of the lens barrels in the turret. The field observed through a given colored rectangle corresponds to the field of the lens with an identical color. Green is for wide angle, red is for the normal field, and yellow is for the telephoto field.

Depth of field: On each of the barrels in the turret is a listing of minimum distances at which the lens can be used at a given *f*-stop. Once you have decided what *f*-stop to use, consult the lens barrel to see from what distance your picture will be sharp.

Parallax correction: The rear finder of the camera is adjustable so that photographers will have correct field of view when shooting at 3, 4, 5 and 8 feet, and infinity.

Shutter release: It is located on the front of the camera. By pushing it straight back, the photographer can get short bursts. By pushing the release back and down, he will start the motor running continuously. When camera is set on tripod photographer can start motor running continuously and step into the picture area and get himself on film.—▶

New Kodak Brownie 8-mm movie camera has three-lens versatility combined with simplicity.

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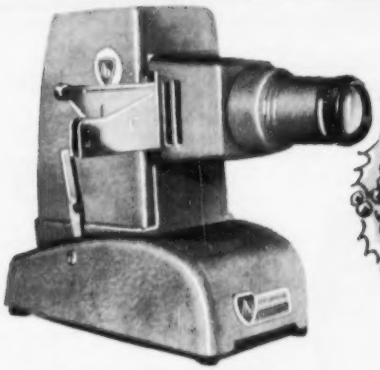

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BRAND NEW Reg. Value $139.50 Leather Case $6.50 — **$49.50** SPECIAL

SAME MODEL AVAILABLE—

- With Shutter Speeds up to 1/200 sec.
- M-X-F Synchro Shutter
- Large Focusing Knob
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BRAND NEW Latest 1955 AUTOMATIC PENTACON

- Fully Automatic Diaphragm
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- 1 Sec. to 1/1000
- with f2.8 Ctd. Meyer Automatic Lens

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DON'T BUY A TWINLENS REFLEX CAMERA! UNTIL YOU HAVE SEEN MINIFILM'S REFLEX BUY OF THE YEAR!

16mm 3-LENS PATHÉ

The only 16mm camera under $1200 with

1. Follow focusing thru-the-lens
2. Variable shutter
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PATHE SUPER 16 DELUXE with

10mm f1.9 Berthiot Cinor Super Fast, Super Wide Angle

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BRAND NEW Complete $704.00 — Only **$70.40** Down

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NEW 4x5 FAMOUS NAME PRESS CAMERA OUTFIT . . .

with 135mm f4.5 Ctd. Steinheil Lens

Compur Synchro Shutter Coupled Range Finder Press Flashgun and with Rotating Graphic Back

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15pc ARGUS C3 OUTFIT

All Brand New With

TELEPHOTO and REGULAR f3.5 CTD. LENS

FLASHGUN — CASE — 6 ROLLS B&W FILM — 3 FILTERS — SUNSHADE & FILTER HOLDER

Camera Case, & Flash Gun $66.50

REG. $102.50 YOU SAVE $22.50 — SPECIAL **$69.95**

CLOSE OUT!

LIMITED QUANTITY!

In closing out these fine precision cameras the German manufacturer made us promise not even to hint at his name, so we won't. However, after one look at these specifications it won't take you long to guess.

REMEMBER! You can't go wrong. Your money back overnight, if you don't lick your chops when you see your lucky purchase.

- f2.8 Steinheil Cassar Color corrected lens
- Prontor SVS Shutter 1—1/300 Second
- Full MX Flash Synchronization
- Double Exposure Prevention Lock
- Self Cocking Shutter
- Automatic film Transport Lever
- Built-in Rangefinder
- Built-in Exposure Meter
- Built-in Self Timer (12 Sec. Delay)
- Custom Finished Black Morocco & Chrome Body

SPECIAL $39.95

Brand New Deluxe case	$5.95
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Take Your Choice of Any One of These 300 Watt

Brand New **AUTOMATIC SLIDE PROJECTORS**

ONLY **$39.50**

Viewlex V33L	Reg. $67.00	$39.50
SVE Skyline, Airequipt Changer & Case	Reg. $67.45	$39.50
AO 300, Airequipt Changer, & Case	Reg. $64.45	$39.50
TDC Showpak, 12 trays & Case	Reg. $60.00	$39.50

GUARANTEED 8mm MOVIE LENSES

We inspected over 100 fine imports and selected only those that we are sure are top-quality, needle sharp and precision made in every detail.

	SPECIAL!	BRAND NEW
1½" f1.4		$29.95
1½" f3.5		7.50
1½" f3.5 Foc. Mt.		11.95
1½" f2.5 Foc. Mt.		14.95
1½" f1.9 Foc. Mt.		22.95
1½" f1.5 Foc. Mt.		28.75
7mm f2.5 W.A.		17.50
6mm f1.9 W.A.		26.50

YOUR MOVIES CAN HAVE FINISHED PROFESSIONAL QUALITY

BUY A COMPLETE ACTION EDITOR OUTFIT TODAY AND SAVE MORE THAN 50%.

	Reg.	Spec.
8mm Mansfield Action Editor	39.95	21.75
8mm Mansfield Deluxe Action Editor	59.50	27.75
16mm Mansfield Action Editor	44.50	25.75
16mm Mansfield Deluxe Action Editor	69.50	31.25
8mm Baia Action Editor	56.75	34.50
16mm Baia Action Editor	56.75	34.50

ALL EDITORS ARE BRAND NEW FACTORY PACKED!

ONLY $8.95 10% Down GETS YOU THE AMAZING 35mm LORDOMAT

NO OTHER CAMERA IN THE WORLD, UNDER $100 OFFERS THESE 3 VITAL, VERSATILE FEATURES!

1. INTERCHANGEABLE rangefinder coupling LENSES normal telephoto wide angle
2. SINGLE WINDOW for viewing and rangefinder focusing
3. RAPID LEVER shutter and film winding Quality comparable to cameras selling for $200-$300

with f2.8 LORDON Lens, click stops.

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HERE'S HOW SIMPLE A FINE EXPOSURE METER CAN BE!

New, Automatic **MINILUX METER**

Remembers your exposure with just a simple push of the button! Famous German precision make. Includes Incident and Reflected light feature.

Reg. $24.50 ONLY **$9.95** BRAND NEW

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Everything from TELE-PHOTO TO CLOSE-UP WITH ONE LENS now possible! EXCLUSIVE LENS COMBINATION focus from 18" to infinity.

180mm f4.5 Schneider Xenar	$177.50
180mm f3.5 Schneider Xenar	230.00
240mm f5.5 Schneider Tele-Xenar	197.50
360mm f5.5 Schneider Tele-Xenar	258.25

NOW- 3-LENS TURRET CAMERA for the PRICE OF ONE!

9mm f1.9 ctd. lens
13mm f1.9 ctd. lens
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Brand New KODAK 8mm BROWNIE TURRET CAMERA with THREE HIGH SPEED LENSES!

ONLY $70.50 — **$7.95** DOWN

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1. Select the equipment of your choice at the prices shown in column one for new equipment or column two for used equipment.
2. If you have equipment to trade, check it it is represented in listing and deduct the allowance shown for it in column three.
3. Rush your order (and trade-in equipment if you have such) plus your remittance to cover—or instructions to ship C.O.D. for the balance or deferred payment terms as per your instructions.

MINIFILM will immediately forward the equipment you desire. Of course your order will be fully insured. OUR FAMOUS 30 DAY MONEY BACK GUARANTEE AND 2 YEAR SERVICE GUARANTEE ASSURES YOU OF COMPLETE SATISFACTION.

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2 YEAR SERVICE GUARANTEE

Lenses for LEICA, CANON, CONTAX, NIKON

	New	Used	Trade-in
21mm f4.5 Zeiss¢	$249.00	$159.00	$120.00
25mm f4 Nikkor¢	169.50	114.00	85.00
28mm f6.3 Hektor¢		64.00	40.00
28mm f3.5 Nikkor¢	149.50	92.50	75.00
35mm f2.8 Biometar		109.00	70.00
35mm f3.5 Elmar		37.50	25.00
35mm f3.5 Nikkor¢	89.50	54.75	40.00
35mm f2.5 Nikkor	139.50	97.50	70.00
35mm f2.8 Serenar¢	110.00	78.00	50.00
35mm f3.5 Summaron¢	96.00	57.25	40.00
50mm f1.4 Nikkor¢	169.50	118.00	80.00
50mm f2 Sonnar	146.00	79.00	50.00
50mm f2 Summitar	88.00	62.95	40.00
50mm f1.5 Summarit¢	177.00	109.95	80.00
73mm f1.9 Hektor		69.00	50.00
85mm f1.5 Serenar¢	238.00	137.50	100.00
85mm f2 Sonnar¢	229.00	99.50	70.00
90mm f4 Elmar¢	90.00	57.50	40.00
100mm f3.5 Canon¢	115.00	73.50	55.00
125mm f2.5 Hektor¢	147.00	96.50	70.00
135mm f3.5 Canon¢	130.00	82.50	65.00
135mm f4.5 Hektor¢	135.00	85.00	75.00
135mm f3.5 Nikkor¢	135.00	69.00	50.00
135mm f4 Serenar¢	108.00	69.00	45.00
200mm f4.5 Telyt¢	156.00	104.00	75.00
400mm f5.6 Novoflex	189.50	114.50	85.00
800mm f8 Canon w/Reflex Hous	585.00	359.00	275.00

Lenses for EXAKTA, CONTAX D, PRAKTICA, PENTACON

	New	Used	Trade-in
35mm f2.5 Angenieux	99.50	56.95	45.00
40mm f3.5 Makro-Kilar	89.95	57.50	40.00
40mm f4.5 Tessar¢	75.00	39.00	25.00
50mm f1.5 Angenieux	165.00	109.00	85.00
50mm f2.8 Tessar PS	65.00	39.50	25.00
50mm f2.8 Westanar	69.50	44.50	30.00
58mm f2 Biotar PS	125.00	63.95	40.00
58mm f1.9 Primoplan¢		44.00	30.00
75mm f1.5 Biotar¢	216.50	93.95	70.00
85mm f2.8 Steinheil¢	65.00	42.00	30.00
90mm f1.8 Angenieux	149.50	95.95	75.00
135mm f4.5 Steinheil¢	60.00	37.00	22.00
135mm f3.8 Sun¢	29.50	22.50	15.00
135mm f3.5 Colinar PS	39.50	29.50	20.00
135mm f4.5 Xenar¢	84.95	49.50	30.00
135mm f4 Triotar¢	75.00	43.75	35.00
180mm f2.8 Sonnar PS		238.00	150.00
240mm f5.5 Xenar¢	124.95	78.00	55.00
400mm f5.6 Novoflex¢	189.50	114.00	85.00
400mm f5.5 Megor PS	199.50	137.50	95.00

ACCESSORIES FOR IMPORTED CAMERAS

	New	Used	Trade-in
Leitz Focaslide	$ 36.00	$ 23.00	$ 15.00
Leitz Imarect Finder	39.00	24.00	16.00
Leitz B.C. Flashgun	24.00	16.95	10.00
Zeiss Revolv. Finder	80.00	42.75	30.00
Rolleikin Back	35.78	22.50	15.00
Rollei B.C. Gun	22.95	14.50	10.00
Univ. Image Erect. Fdr.	24.50	16.00	10.00
Micro Ibso Attach.	108.00	79.00	60.00
Novoflex, Bellows for Leica, Contax	34.50	22.50	15.00
Novoflex for Exakta, Pentacon, etc.	34.50	22.50	15.00
Novoflex Reflex Housing for Leica-Contax	99.50	59.00	50.00
Novoflex tripod and Stereo Rackover	18.50	12.00	9.00
Panoramic attach.	11.50	7.00	4.00
Novoflex Universal			

LEICA CONTAX NIKON CANON

	New	Used	Trade-in
Contax I f2.8 Tessar		$ 41.95	$ 25.00
Contax III f2 Sonnar		99.50	75.00
Contax IIA f2 Sonnar*	345.00	144.50	125.00
Contax IIIA f1.5 Sonnar*	412.00	188.95	165.00
Leica IIIA f2 Summar		79.50	55.00
Leica IIIC f2 Summitar¢		114.00	90.00
Leica IIIF f2 Summitar¢*	268.50	145.95	120.00
Leica IIIF f2 Summicron	336.00	171.95	145.00
Leica IIIF f1.5 Summarit	357.00	174.95	150.00
Leica M3 f1.5 Summarit¢	468.00		230.00
Nikon S f1.4 Nikkor¢*		159.95	115.00
Nikon S2 f1.4 Nikkor¢*	345.00	224.00	175.00

35MM SINGLE LENS REFLEX

	New	Used	Trade-in
Exa f2.8 Westar MXc	$ 85.00	$ 41.95	$ 30.00
Kine Exakta f3.5 Tessar¢*		69.95	45.00
Exakta VX f2 Westagon Auto	279.50	169.00	140.00
Exakta VX f1.9 Xenon Auto	341.70	189.95	150.00
Contaflex f2.8 Tessar	169.00	81.50	70.00
Contax D f2 Biotar P.S.		89.95	70.00
Praktiflex f2 Biotar¢		69.00	45.00

35MM CAMERAS

	New	Used	Trade-in
Agfa Karat f2.8 RF		$ 32.00	$ 20.00
Argus A-4 f3.5¢*	32.50	22.00	15.00
Argus C2 f3.5 RF		19.00	12.00
Argus 21 f3.5¢*	59.50	29.50	20.00
Argus C3 f3.5 outfit	66.50	29.50	23.00
Argus C4 f2.8 RF MX	84.50	42.00	32.00
Super Bald. f2.8 RF MXc	69.50	45.00	30.00
B&H Foton f2 RF MX	498.00	265.00	200.00
Bolsey B f3.2 RF¢	49.50	19.00	12.00
Bolsey B22 f3.2 RF¢*	69.50	35.50	25.00
Bolsey C22 f3.2 RF¢*	99.50	56.95	40.00
Contessa f2.8 RF meter		83.95	60.00
Contina II f2.8 RF	110.00	69.50	60.00
Futura P f2.8 RF¢	129.50	49.50	35.00
Graphic 35 f3.5 outfit	89.50	53.50	45.00
Kodak Bantam f3.9 RF	56.75	39.50	25.00
Kod Pony 828 f4.5 C*	29.50	16.95	10.00
Lordomat f2.8 RF¢	89.50	59.50	45.00
Retina IIIC f2 RF	190.00	115.95	85.00
Retina IIA f2 Xenon		69.95	55.00
Kodak Signet f3.5	75.00	41.00	35.00
Minox IIIS outfit	139.50	78.95	55.00
Mercury II f2.7¢*	41.50	18.95	10.00
Robot Royal f1.9 Xenon	295.00	168.50	135.00
Robot II f2 Biotar		54.00	25.00
Robot Star f1.9 Xenon	99.50	74.50	55.00
Voigt Prominent f2	220.00	124.95	90.00
Voigt Prominent f1.5	270.00	135.95	100.00
Voigt Vitessa f2 RF		82.50	55.00
Voigt Vito II f3.5¢*		23.95	15.00

35MM STEREO CAMERAS

	New	Used	Trade-in
Kodak f3.5¢*	84.50	50.95	35.00
Realist 45 f3.5	88.50	57.00	40.00
Revere f3.5 RF¢*	174.50	73.95	60.00
Stereo Realist f3.5 RF	159.00	64.50	55.00
Stereo Realist f2.8 RF	198.50	106.95	90.00

2¼x2¼ REFLEX CAMERAS

	New	Used	Trade-in
Ansco Reflex f3.5¢	$189.35	$ 79.00	$ 55.00
Ciroflex B f3.5¢		27.00	15.00
Ciroflex D f3.5¢	75.00	33.95	20.00
Ciroflex E f3.5/400¢*	99.50	49.50	30.00
Exakta 66 f2.8 Tessar	319.50	179.50	150.00
Graflex 22 f3.5 C*	74.50	44.00	35.00
Hasselblad/1000 f2.8	379.50	196.00	175.00
Ikoflex IIA Auto f3.5	126.00	72.95	55.00
Ricohflex VI f3.5¢*	29.95	18.75	12.00
Rolleicord III f3.5 Xenar	58.95	45.00	
Rolleicord V f3.5 Xenar	134.55	87.50	70.00
Auto Rollei f3.5 Tesar		88.95	60.00
Rollei Sync f3.5 Tessar¢*		107.50	80.00
Rollei MX f3.5 Xenar	217.50	115.95	100.00
Rollei MX f3.5 Tessar	232.50	125.95	105.00
Rollei MX f2.8 Xenctar	291.50	175.00	140.00

ROLL FILM CAMERAS

	New	Used	Trade-in
Kodak Chevron f3.5 RF	198.50	127.50	90.00
Medalist I f3.5 Ektar		53.95	40.00
Polaroid Highlander	69.95	38.50	30.00
Polaroid Land¢*	89.75	38.95	30.00
Polaroid Pathfinder f4.5	249.50	145.95	110.00
Super Ikonta BX f2.8 RF	163.00	79.00	60.00

PRESS CAMERAS

	New	Used	Trade-in
4S Ann. Graphic RF f4.7		89.50	65.00
4x5 Linhof Super Tech RF f4.5 MX	389.75	198.00	165.00
23 Speed Graphic f4.5 RF	313.95	146.95	105.00

SLIDE PROJECTORS

*Blower cooled

	New	Used	Trade-in
Argus PB300 case	$ 48.50	$ 23.95	$ 18.00
Argus 300W Auto case	66.50	43.50	30.00
GoldE Manumatic 300W*	56.50	24.50	18.00
Kodak Table Viewer 4x		26.95	15.00
LaBelle 22 200W	69.00	46.50	35.00
LaBelle 55 500W*	79.50	47.95	35.00
LaBelle Director 300W*	59.50	39.50	30.00
Revere 555 500W* case	79.50	49.50	35.00
Revere 888 500W case	119.50	68.95	55.00
TDC Headliner 300W	49.99	27.50	20.00
TDC Mainliner 300W	59.50	30.50	25.00
TDC Model D 300W	67.50	31.50	25.00
TDC Duo 300W* 2¼*	67.50	33.95	25.00
TDC Stereo View 300W*	144.50	96.50	70.00

8MM CAMERAS

	New	Used	Trade-in
B&H 134V f2.5¢	$ 99.95	$ 38.95	$ 28.00
B&H 252 f2.3 Monterey	59.95	37.95	28.00
Bolex B8 f2.8 Yvar Tur	119.50	68.50	55.00
Bolex C8 f2.5	89.50	55.00	40.00
Bolex-H8 Leader f1.9	259.50	142.95	115.00
Bolex 8mm Pancinor f2.8	219.50	141.95	100.00
Cine Kodak Mag f1.9¢	149.50	88.95	55.00
De Jur Fadematic f1.9¢	149.50	92.95	65.00
Keystone Olympic f2.5	79.95	45.95	30.00
Revere 50 f2.8¢	49.50	22.95	18.00
Revere 88 f2.5¢	74.00	31.95	25.00
Revere 80 f2.5¢	97.50	42.95	35.00
Revere 84 f1.9 Turq	147.50	83.95	60.00
Revere 44 f1.9 Mag. Tur.	154.50	91.95	65.00
Revere 863 f2.8 Mag.	142.50	83.50	55.00
Zoomar 8 f2.8	199.00	139.00	100.00

8MM PROJECTORS

	New	Used	Trade-in
Ampro Futurist 750W	$149.95	$ 84.50	$ 60.00
B&H 253 Monterey 500W	79.95	46.95	35.00
Bolex M-8 500W case	169.50	112.00	85.00
De Jur 1000W case	177.50	104.95	85.00
Keystone K109 750W	159.50	88.00	65.00
Kodak Brownie 300W	62.00	39.50	30.00
Revere 85D 500W	114.50	56.50	45.00
Revere 90 750W	125.00	65.50	55.00

16MM CAMERAS

	New	Used	Trade-in
Arriflex 16 (3 lenses)	2106.00	1300.00	1000.00
Bolex Stereo	387.00	86.00	60.00
B&H 200 f2.5 Mag¢	174.95	108.00	88.00
Bolex H16 Leader (3 lenses)	399.45	228.50	180.00
Bolex Pan Cinor f2.8	349.50	169.00	125.00
Cine Kodak K100 f1.9	269.00	169.50	140.00
Kodak Royal Mag f1.9¢	169.50	104.50	80.00
Keystone A12 f1.9 Turq	159.50	97.00	65.00
Keystone f2.5 Mag¢	129.50	82.50	60.00
Pathe Super 16 Turq	450.00	229.00	180.00
Revere 16 f1.9 Mag¢	182.50	87.00	60.00
Victor IV f1.9 Tur		99.00	60.00
Vistascope Outfit	125.00	79.00	65.00

16MM PROJECTORS

	New	Used	Trade-in
Ampro Imperial 1000W	$299.50	$197.00	$150.00
Bolex G-8-16 750W	339.50	235.00	150.00
B&H 273A 750W case	199.95	117.50	90.00
B&H 173 750W case	299.95	185.00	125.00
Keystone A82 750W	139.50	75.50	55.00
Keystone K161 750W	159.50	85.00	65.00
Kodascope Royal 1000W	240.00	164.00	115.00
Revere 48 750W case	182.50	95.00	60.00

16MM SOUND PROJECTORS

	New	Used	Trade-in
Ampro Stylist 1000W	$419.85	$265.00	$185.00
Ampro Premier 40 1000W	579.00	397.00	250.00
B&H 285C 75W case	449.95	249.50	200.00
B&H 285 BI 1000W	514.95	319.00	230.00
B&H 202C 1000W	699.00	444.00	375.00
Kodak Pageant 1000W	375.00	259.00	190.00
Revere SP16 750W	325.00	163.00	135.00
Victor Lite Wt. 750W	395.00	269.00	180.00

ELECTRONIC FLASH

	New	Used	Trade-in
Ce Be I Portable	$ 69.95	$ 29.50	$ 20.00
Dormitzer 208B Port	180.00	109.50	75.00
Dormitzer DB I Port	109.50	49.50	30.00
FR Port	54.95	36.50	25.00
Heiland VII Pro-Pak	55.95	39.50	30.00
Heiland IV	369.50	209.00	130.00
Leitz Braun-Hobby	89.95		40.00
Mighty Lite AC	49.95	29.50	15.00
Strobo II flash, Port	115.00	69.00	40.00
Sunlite "500" Port	49.50	29.50	20.00
Sunlite II 225, Port	79.50	49.50	35.00
Sunlite II model 110 AC	62.50	39.50	25.00
Ultrablitz Expert II M Port-AC, Special	49.50	38.50	20.00

TAPE RECORDERS

	New	Used	Trade-in
Ampro 731R		$ 49.00	$ 25.00
Federal FME 37C	139.50	86.00	60.00
Pentron 9T-3C	189.50	79.50	55.00
RCA 402	229.95	159.00	100.00
Revere 700D	212.50	129.50	105.00
Revere T100	169.50	74.50	50.00
Revere T1100	159.50	92.50	75.00
Revere TR600	234.50	117.50	75.00
Revere TR1000	249.50	149.00	110.00
Revere T10	235.00	139.00	105.00
TDC Stereotone	249.50	138.50	105.00
Webcor 2020	169.50	107.50	80.00
Wilcox Gay 4F10	199.95	124.00	100.00
VM Tape-o-Matic 700	179.95	109.00	85.00

ENLARGERS

	New	Used	Trade-in
23C De Jur I f4.5	126.50	82.50	60.00
45C De Jur Prof. f4.5	172.50	107.00	75.00
57D Elwood 52	69.00	44.50	30.00
57C Elwood 5P25	145.00	89.50	60.00
35C Veigel f3.5 RF	114.50	73.50	50.00
2¼C Veigel f4.5 RF	189.50	117.00	80.00
23CL Federal 269CL f6.3	57.95	32.00	22.00
45D Federal 450 f4.5	119.95	67.00	40.00
23D Fotolarger D69 f6.9	34.95	20.50	15.00
45D Fotolarger f4.5	93.95	56.50	40.00

¢ coated * flash synchronized

MINIFILM CAMERA CORP.

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Dept. P4 (bet. 46th & 47th Sts.) JUdson 2-1416

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FRESH COLOR FILM

This late 1956 dated film is in its original sealed package fully guaranteed by the manufacturer. Day or Tung. Price includes processing & mounting (35mm) by manufacturer. MINIMUM ORDER—3 ROLLS.

Size.	Kodachrome	McGregor Color (1957 DATE)	Dynacolor
8mm x 25' dble. roll	$3.60	$2.40	$2.30
8mm x 25' dble. mag.	3.60	3.50	3.50
16mm x 50' mag.	5.40	5.35	5.25
16mm x 100' roll	9.40	9.85	9.75
35mm x 20 exp.	2.60	1.65	1.75
35mm x 36 exp.	3.65	2.25	3 for 6.50
35mm x 12 exp.	....	6 for $5	....

FRESH MOVIE FILM

1957 dated, fast, fine grain, panchromatic ASA 50. Prices include new fast processing service.

8mm x 25' dble. roll $1.10
8mm x 100' Bolex dble. roll 3.50
16mm x 50' mag. 1.75
16mm x 100' roll Ansco 2.75
16mm x 100' 2.50
16mm x 100' Kodak Plus X 2.95
16mm x 50' roll, Plus X 1.65
16mm x 100' Kodak Super XX 3.00
8mm Mag. B & W 2.00
16mm x 50' mag. E.K. X or XX 2.25

BUY SIX . . . GET ONE EXTRA FREE

KODAK 16mm MOVIE Kodak Processing included

KODACHROME 16mm x 100' Day. or Tung. $5.95
O.D. Kodachrome 16mm x 100' Day. or Tung. 2.95
Super XX 16mm x 50' magazine 2.75

HIGH SPEED MOVIE ASA 200. '56 date. Proc. incl.

8mm x 25' Roll ..... $2.45 ea.; 3 for $7.05
8 or 16mm x 100' roll ..... 5.70 ea.; 3 for 16.20
16mm x 50' mag. ..... 3.90 ea.; 3 for 11.10

COLOR FILM MFR. PACKS UNDER AWON LABEL!!!!

Late 1957 Date. Price includes processing & mtg. All Kodachrome filters can be used with this film.

8mm x 25' dble. ..... $1.98 ea.
3 for $5.75 ..... 6 for $11
35mm x 20 exp. ..... $1.79 ea.
3 for $5.00 ..... 6 for $9.75
16mm x 50' roll ..... $2.95 ea.; 3 for $8.25
8mm dble. or 16mm x 100' roll $5.25 ea.; 3 for $15

FREE! FREE!
With every order of $25 or more (except Kodachrome)—you get a FREE 1-year subscription—$4 value—to Modern Photography or U. S. Camera (specify).

FRESH AERO EKTACHROME ASA 50
35mm x 20 exp. $1.55 ea. 4 for $5.25
Processing included
BUY SIX—Get One FREE
35mm x 40' bulk $5.35
35mm x 75' bulk $7.95
35mm x 75' plus 1½ gal. devel. kit $10.50

ANSCOCOLOR
1956 Date - Day. or Tung.
35mm x 100' $21.50
35mm x 50' 12.49
35mm x 27½' 6.95
35mm x 20 exp. in metal cart., ea. 1.20
6 for $5.50; 12 for $10

ANSCOCHROME
28 ft. x 35mm. Orig. Pack.
$7.99

Aero Ektachrome
8mm x 100' $4.75
16mm x 100' $4.75
3 for $13.25

MOVIE—QUANTITY DISCOUNTS
B&W ASA 50. Reversal. No Processing

SIZE	54 Rolls	27 Rolls	15 Rolls
16mm x 25'	$8.95	$4.95	$2.75
16mm x 50'	19.95	10.95	5.95
*16mm x 100'	49.50	29.50	17.95

*Camera Spooled.

AERIAL FILM Recent date! In original metal containers.

KODAK XX
5¼"x50' ..... 4 for $1
5¼"x20' ..... 2 for $1
5¼"x50" $1.25
7"x125' 5.95
9½"x75' 7.95
9½"x200' 9.95

KODAK TRI-X
5¼"x20' ..... 2 for $1
5¼"x50" $1.25
7"x18" ..... $1 ea.
7½"x62' $2.98
9½"x75' 7.95
9½"x200' 9.95

AERO EKTACHROME ASA 40
with 1½ gallon processing kit
5¼ x 20' $6.95
5¼ x 40' $9.95
2 x 18' $5.95
35mm x 37½' $6.95
FREE Compensating Filter with any of above!

35mm Fresh Bulk Negative Safety
Kodak Plus X, Sup XX, Kodak Weston 24 Microfile, Ansco ASA 50 or DuPont 21 or 22
100' ..... $1.98 ea. 400' $7.50
FREE, 100' of ASA 24 w every 100' order!

35mm x 20 Exp. Cart.
Plus X, Sup XX, Tri-X, Infra Red, Microfile
6 for $1.50 ..... 12 for $2.50

CUT FILM SPECIALS
4 x 5—original box of 25 sheets—3 boxes for $3.50
Your choice of KODAK XX, Portrait Pan, Infra Red; DUPONT X-F Pan, Arrow Pan; ANSCO Super Pan Press, Tri-X Ortho.
8 x 10 original box of 25 sheets—$2.95 per box
Your choice of KODAK Super Pan Press, Type B, Infra Red, Tri-X; DUPONT X-F Pan, Arrow Pan; ANSCO Super Pan Press, Process, Comm. Ortho.
Ansco Color Day. or Tung. (10 shts. per box)
4 x 5 ..... $2.50 ea.; 6 for $12
8 x 10 ..... $3.95 ea.; 3 for $11

CONTACT PAPER SALE In original mfrs. box!
7½ x 7½, SWGL—box of 250 sheets $2.75
10 x 10" SWSM—1 box (100 sheets) ..... 98¢
20 x 24" SWSM (50 shts.) $1.95
8 x 11½" Reflex Copy (100 shts.) $1.50

Polaroid Film, Type 31 ..... 6 for $5

20% Deposit on all C.O.D. please. U. S. Excess Please include postage with all orders.
25% Discount on all Photographic Material

AWON FILMS

Send 25¢ for complete 52 page catalog listing all photo equipment at unbeatable prices.

108-P W. 29th St., New York 1, N. Y.

Films for Profit

(*Continued from page* 130)

mended for every type of film. It lists the various sequences, notes where the shooting will take place and describes necessary props and models. Count on shooting 3 to 4 times the amount of film planned for the final edited version. Therefore, your film cost for a ten-minute reel will be $120 to $170 for color, or $100 to $130 for black-and-white.

All shooting should be done at 24 frames per second. If duplicates are to be made, single- or double-perforated film can be used. If the original film is to be provided with magnetic sound, single-perforated film is recommended. Check with the film manufacturer for the emulsion best suited to your purpose.

If films are duplicated, there is no need for trying to make fades or lap dissolves in the camera. These transitions can be made easier and more skillfully in the laboratory. However, it is wise to note such transitions in the shooting script so that the connecting scenes are shot about two seconds longer to allow for the film lost in the transition. Certain types of double exposures can also be done in the laboratory.

Photography should be on the highest level. Try to place yourself in the customer's position and strive for a film which succeeds in conveying its purpose to the audience. For example, to you a dark, menacing cloud may have great pictorial value, but this would hardly be welcomed by a travel agency, interested in showing a particular locale to best advantage. In this case, all outdoor scenes should be taken on bright, sunny days. If necessary, use reflectors to lighten shadows. Indoors strive for professional lighting. Actors should be evenly illuminated. Lighten backgrounds when necessary. If you don't own spotlights and broads rent them from professional motion-picture-equipment houses in larger cities.

Choosing actors

Persons used in a professional film should be attractive, of the correct type for their role, and suitably attired. Make your selections very carefully and, if necessary, engage professional models. Professional modeling talent is especially important when demonstrating a manufactured product. Fees for professional models run from about $12 an hour; up. Since most commercial films are considered advertising, be sure to obtain a signed model release from everyone.

Editing

If the original is to be used in the final showings, editing is the same as for an amateur film. However, this is not the case if prints provided with optical sound are to be made from the originals, as is usually the case in commercial films. When the films are returned from the processing laboratory, check them in an editing viewer or, better still, by projection. In either case, be sure the film channels are absolutely clean to avoid scratching the film. Discard material which you know will not be used. Send the remaining film to a laboratory and have an edge-numbered work-print made, either in color or black-and-white. The latter is usually sufficient for editing. Edge numbering refers to consecutive, corresponding numbers (one number per foot) placed on the edge of the original and work-print.

All editing should be done on the work-print where you need not be troubled by scratches or imperfect splices. Decide now where fades and lap dissolves are to be used. When editing such material, about one additional foot will allow for fading in and out. With lap dissolves, this additional foot at the beginning and end of two connecting scenes should be cut out before the sound recording is made. This is necessary since in the final film the two scenes will overlap. (One foot is an average used by most laboratories; check with your source for exact length.)

The cost of making a work-print is about 6 cents a foot for black-and-white and 11 cents for color. Therefore, if we have three times more film than planned for the final version, the work-print cost will amount to approximately $72 for black-and-white and $132 for color. When the work-print is edited, present it to your customer and discuss any changes which he might require.

The narration script

Most commercial films require narration, making a script necessary. While it is best to engage a professional writer, it is not essential to find one with experience in motion-picture-script writing. Frequently suitable persons can be found at local radio and TV stations or advertising departments. Fees for script writers vary too much to give an average figure. Find out the cost before quoting your customer. The two main shortcomings of many narrative scripts are:

a) Too many words. It is hardly necessary to narrate an obviously self-explanatory scene.
b) Mentioning things which are not shown in the film.

When the script is written, type it double-spaced, ending each page with a complete sentence or, better, a completed paragraph for easier reading. Note the scenes which will cue the narrator for the beginning of a new sentence or paragraph. Practice reading it aloud during projection. Do not go to the recording studio until the script flows smoothly.

Recording of narration and background music

When selecting a narrator, it is wise to choose someone not only with a good voice, but with recording experience as well. The recording studio will probably furnish you with a list of narrators and can suggest a suitable voice for your particular film. Other good sources are local radio, TV stations, and theatre groups. Give the script to the narrator a few days in advance so that he can study it and be prepared. Fees for experienced narrators vary from about $70 to $500 for one reel (10 min). In addition you will pay for the use of the recording studio which is about $75 an hour.

Usually the narration is first recorded on tape and then rerecorded on film together with the background music.

A good studio can be of great help in the selection of appropriate music. It has

EASY DOES IT

WITH THE VOIGTLANDER

VITO IIa

35 MM FOLDING CAMERA

Everything about the new VITO IIa has been designed to get you better pictures, much easier, and at lowest possible cost. For example, you flip a lever and the film is automatically transported and the double exposure prevention is locked in place. There's the famed Voigtlander Color-Skopar f/3.5 color-corrected lens that gives sharp detail from edge to edge. There's a newly designed direct view optical finder with an unusually large image, permitting you to see better. There's a clever "pop-up" rewind knob for quick and easy film rewinding. There's simplified far or near "zone" focusing. We could go on like this — with feature after feature — but we suggest that you see the VITO IIa for yourself, and get a new conception of "ease in photography", as created by Voigtlander, world's oldest camera manufacturer, first with the ideas others copy.

Voigtländer *because the lens is so good*

Voigtlander VITO IIa 35mm Folding Camera, with Color-Skopar f/3.5 Lens, Prontor SVS Shutter with Speeds from 1 second to 1/300th, and M-X Synchronization. Only $54.50

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This Store Displays and Sells the World's Finest Photographic Equipment

FOR THE DARK ROOM

SAVE 50% ENLARGING LENSES

We are proud to present three unusual values in brand new, coated, color-corrected, anastigmatic lenses, specially constructed to give corner to corner sharpness in enlarging—at prices half and lets than those you'd expect to pay for such fine lenses. *Ship. Charge 25c*

2" f.4.8, Leica thread, for 35mm $7.95
3½" f.4.5, clickstops, for 2¼x2¼", 2¼x2¼" 9.95
5½" f.4.5, clickstops, for 4x5 ..... 19.95

ELECTRIC 2-SURFACE DUO-DRIER

MODEL "B"

$7.95 WITH 2 12x17 HEAVY DUTY FERROTYPE PLATES AND STAND

Yes, Spiratone does it again! A complete, ready-to-use, double surface drier with a capacity of 4 8x10 or 36 2¼x3½ prints. Singleweight or doubleweight, glossy or dull finish—simply constructed, yet as efficient as units costing several times as much. Works on AC or DC. *Shipping Weight 10 lbs.*

SINGLE SURFACE DRYER with 12x17 ferrotype plate, $4.89
Suggestion: Bottle of Ferrotype Polish 35c. Stainless Steel Squeegee Roller 95c

ALL METAL 11 x 14 EASEL

INCLUDING FOOTSWITCH $7.69

- Solid frame guide on 4 sides for proper alignment.
- Spring steel masking bands calibrated in inches and mm.
- Adjustable for all sizes from 1x1" to 12x15".
- White enameled base.

Extra sturdy (net weight 4 lbs.). Plug enlarger cord into footswitch and you are ready to dodge, vignet and fully control your "blow-ups". *Combined Ship. Wt. 6 lbs.*
8x10 Enlarging Easel, same construction as above, with footswitch. $4.98

DEVELOPING TANK

ADJ. FOR 35MM, 828, 127, 120, 620, 116, 616, $1.49

Simple bayonet lock for different size adjustments. Vents for quick changing of liquids. Agitating rod. Easy loading in darkroom — other operations in daylight. Easily worth double. Tank with spare reel, $2.39 *Sh Wt. 2 lbs.*

ENLARGING TIMER

$6.95

60 sec. range, with second markings. Current shuts off automatically at end of desired time interval. Built-in lock holds knob at desired position, until toggle is released. Adjustable stop for repeat exposures. Manual operation for focusing. Enlarger or printer plugs right into receptacle on cord timer. *Shpg. Chge. 30c.*

AUTOTILT PRINT WASHER

All metal 12x15" works in any sink. If bought at same time as any darkroom items of $4.98 and up, only $1 *Shpg. Wt. 3 lbs.*

6 PC. ENLARGER ACCESSORY KIT

REG. $8.00 $3.90 VALUABLE TO BEGINNERS AND ADVANCED AMATEURS

Set contains sturdy footswitch, funnel, pair of print tongs, Enexpo Enlarging Exposure Meter which shows required time for any paper directly on chart, regardless of enlargement size, and Teststrip maker which helps check accurate exposure and shows where to dodge. *Shipping Weight 6 lbs.*

FREE WITH SET: Argeo Print Washer, fits faucet, a $3.00 value.

CHANGING BAG

ONE OF THE MOST IMPORTANT "TOOLS" OF ANY PHOTOGRAPHER

Double zippered inner and outer bags, made of the finest cloth, make this bag 100% light proof even in brightest sunlight.
Whether for use in an emergency, with a film torn or pulled off the spool in a 35mm camera, or for reloading cut film holders or for developing film when no darkroom is available ... the changing bag is justly referred to as a "portable darkroom". 17 x16" working space plus elastic sleeves.
All these features at the lowest price a quality changing bag that was ever offered at. *Shipping charge 25c.* $3.95
PROFESSIONAL MODEL. 22" x30" working space, ($11.00 value) *Shipping Charge 50c.* $6.95

3 UNIT REFLECTOR OUTFIT $5.49

- Two aluminum 10" reflectors for #1 or #2 bulbs
- One bullet reflector for spot effects

All three complete with swivel joint, switch, socket, clamp and cord ... at a fraction of their usual cost. *Shipping Weight 7 lbs.*
SUGGESTION: 2 #2, 1 #1 photoflood bulbs 86c.

PHOTOFLOOD STAND PLUS TWO REFLECTORS

- 3-section metal stand extends 6'4".
- Sturdy, braced legs with rubber tips.
- Stand telescopes compactly to only 2 feet.
- Positive locking at any desired height.

The ideal indoor lighting setup. 22" crossbar, can also be used to hold screen, backgrounds. Two spun aluminum 10" reflectors (for #1 or #2 photofloods), complete with sockets, switches, 6 cords, ball socket swivel joints, rubber jawed spring clamps. Can be used on cross bar or furniture. *Shipping Weights: Stand 4 lbs.; Reflectors 4 lbs.*

$11 VALUE $6.98 COMP

Now with new SWIVEL CROSSBAR

SUGGESTION: 2 #2 photoflood bulbs ..... $ .86
Extra clamp on bullet with bulb (for semi-spot) 1.79
Extra photoflood stand with swivel crossbar 3.98

Looking for a Strobe? Confused by exaggerated claims, technical terms? Write for free pamphlet "S"—you'll know then what to look for!

Spiratone AUX. TELEPHOTO and WIDEANGLE LENSES

FOR COLOR — FOR BLACK AND WHITE

By far the most popular accessory for the 35mm camera owner! Spiratone lenses add to the camera the advantages of telephoto effects for improved perspective in portraits, for moderate distance shots so that the important subject matter will fill the entire negative or slide, and of wideangle effects, for landscapes, and indoors, where space is limited, of greater depth of field.

SPIRATONE LENSES OFFER THESE EXTRAS:

- Built-in or Separate Filterholder furnished for each (set of) lens(es)
- Interchangeability of standard adapters, so that one lens may often be used with several cameras (each lens is supplied with only one adapter—extra adaptors are $1.25 each, when suited).
- Extra hard S-coating.
- Excellent color-correction.
- Lifetime Service Guarantee.
- No change in exposure or lens opening needed.
- Comprehensive instructions for simple use—lenses fit your camera like filterholders, require no installation.
- Availability of filters — your free choice of any TWO with every aux. lens you buy, selected from these: yellow, orange, green, haze, red, blue. Others $1.00 each.
- Availability of MATCHED telephoto and wideangle finders, and a special Universal Finder.
- Finders fit accessory clip, can also be used handheld.

UNIVERSAL AND CLOSEUP (+1, +2, +3) FINDER, the most versatile finder ever made, matched to your normal 50mm or 44mm lens, telephoto and wideangle Aux. Lenses. Has parallax correction to 10', for use with +1, +2, +3 closeup Lenses, and from three feet to infinity. $9.95

Each lens in leather case (incl. 2 filters) *Shipping Charge 25c* $16.95
Set of both lenses, in double leather case (including 4 filters) *Shipping Charge 60c* $29.95
Each Finder, telephoto or wide-angle both for $7.49 $3.95
Universal 44mm finder, for Contessa, Bolsey, Sig. not etc. reg. $.50 $4.98
Accessory Clip for Argus C3, easily installed $1.00
Accessory clip, easily glued to most cameras 75c

GREAT NEWS

Spiratone aux. telephoto and wideangle lenses, greatly improved, are now available at the same low prices for 2¼ x 2¼ Twinlens Reflex Cameras—Rolleicord and Rolleiflex bayonet mount (f:3.5 only), Ciroflex, Graflex 22, Ricohflex, Kodak Reflex. For twinlens users seeking a moderate increase or decrease in focus length, Spiratone aux. lenses add greatly to the versatility of their camera.

SPIRATONE AUXILIARY LENSES ARE AVAILABLE FOR THESE 35MM CAMERAS AND MANY OTHERS

ARGUS C3, C4
BANTAM
BOLSEY
CONTAFLEX
CONTESSA
EDINEX
EDIXA
KODAK 35
MERCURY
RETINA
SIGNET
VITO

MINUS LENSES for TELEPHOTO EFFECTS

If you have a camera using, or capable of using a bellows or extension tube set, you will want to invest in Minus Lenses for the thrill of taking telephoto shots without buying a regular telephoto lens, or extreme telephoto shots, in conjunction with your telephoto lens, for example, a single Minus 4 lens makes your 135mm telephoto into a 270mm telephoto—varied combinations will produce a variety of effects. Minus Lenses improve the perspective in portraits, too, by lengthening the effective focus length. Thousands of Exakta, Praktica, Contax S and Leica, Canon owners with reflex housings find Minus Lenses most useful accessories.

PER 3 PER 4
Minus Lenses are mounted in Metal Rings and are sold in sets of three (of your selection) or four. Available in Minus 1, 2, 3, and 4. *Shipping Charge 10c.*
SER. V —$3.60—$4.70
SER. VI —$4.35—$5.65
SER. VII—$8.00—$7.80

SAVE 50% AND MORE ON POLASCREENS

w. o Pola Screen — w. Pola Screen

The most useful lens accessory made, equally suited for ALL color and b&w films.
Eliminates reflections in scenery, water, show-windows, increases contrast between cloud and sky, the ONLY sky filter usable with Kodachrome, Anscocolor, Ektachrome. Polascreens have double threaded rings to allow use of extra filter or closeup lens, handle for convenient adjustment of maximum polarizing effect. *Sh. Ch. 10c*

Ser. IV 3.75 Ser. VI 4.75
Ser. V 3.75 Ser. VII 5.75

Polarizing Filters to fit standard filterholders.
Unmounted: Ser. V $1.49, Ser. VI $1.98

SALE IN OPTICAL GLASS FILTERS

Filters are the tools of the photographer—yet, fine filters, made by the best known manufacturers in the country, need not be costly. Each filter is ring-mounted, and engraved as to type.

Ser. IV $1.15
V 1.30
VI 1.50
VII 2.00

FREE on request: Famous Make Filter Compartment Case with purchase of 4 or more Ser. V, or Leather Filterbank with 6 or more Ser. VI filters (incl. polarizing) and closeup lenses. Cases cost regularly $3.50 (Ser. VII), $1.25 (Ser. V).

"About Filters, Closeup and Minus Lenses" is a booklet crammed with valuable info. Send 25c, or free on request with orders of $3.00 or more.

FOR B&W: lt. and med. yellow, green, orange, haze, red and infra-red.
FOR ANSCOCHROME/ANSCOCHROME: 10, 11, 12, UV 15, 16, 17.
GENERAL: Neutral Density 2X & 4X.
FOR KODACHROME & EKTACHROME: Haze, Skylight, 2A, 2B, 85B, Type A, Blue 80, 82A, 1D, 2D, 81, 81A, B, C, D, LF
CLOSEUP: +1, +2, +3
FOR THE NEW EKTA CHROME: 85C, 82A, 82B, 82C.
LENS SHADES: Ser. V $1.25, Ser. VI $1.50, Ser. VII $3.00.

Shipping Charges 1 to 5 filters 10c, 6 or more 30c.

FOR THE 8MM & 16MM MOVIE FAN

8PC. DELUXE MANSFIELD ACTION EDITOR

SAVE 50%

8MM MODEL Reg. $59.50 $29.75

FREE with Deluxe Action Editor: Elegant Reelchest, for 12 reels (specify 200, 300, or 400 ft. cap.) *Shpg. Wt. 12 lbs.*

16MM MODELS, same as 8mm but with 2,000 ft. rewinds, reg. $69.50 $34.75

Diecast base comes readily apart for compact storage. Action Viewer has focusing AND framing control, projects brilliant image on 2x3" screen. Easy to thread, scratchproof, scientific ventilation of lamphousing. Complete Outfit: Viewer, 3 piece base, automatic master splicer, cement, pair of 1200 ft. rewinds.

$9.95 Value Pocket Titler — COMBINATION OFFER: 8MM EDITOR, REELCHEST, NEW POCKET TITLER, a $73.00 value. Name your camera lens when ordering. $35.95

4 pc FAMOUS MAKE 8mm EDITING OUTFIT $10.95

A value like never before!

SAVE $10.55

Outfit contains Projection Editing Viewer, with bulb, pair of rewinds with brakes, all metal splicer, all ready for simple mounting on board or table (not supplied). Can you afford to pass up such a value? *Sh. Wt. 6 lbs.*

CINE TITLER

REG. $5.95 For 8mm & 16mm $3.59

SAVE 40%

Titles add action, provide continuity for your movies! Yet making titles is so simple with the Cine-Titler! Sturdy metal construction. Auxiliary lens for exact focus. Photograph picture postcards, titles of your own design: you can even shoot animated titles—an instruction booklet accompanies every titler. *Shipping Weight 4 lbs.*
Titler alone $4.84

If purchased at the same time as Action Viewer, Action or Super-Deluxe Editor

SUPER DELUXE 8mm EDITOR

$14.95

Same viewer, rewinds as above, but with automatic splicer, plus metal base—a $26.00 5 pc. set. *Sh. Wt. 6 lbs.*

SALE IN METAL REELS and CANS

8mm: 200 ft. sets 6 for 3.30; 400 ft. sets 3 for 3.90; 200 ft. sets 5 for 3.40
Ship. Wt. per lot 5 lbs.

8mm ACTION VIEWER

$16.89

- Projects brilliant 2" x 2" pictures in full action on the built-in groundglass screen—not just one frame at a time, but in continuous motion.

A viewer which makes editing a real pleasure. Operator can adjust focus to his own vision. Easy to thread, scratch-proof, scientific ventilation of lamphousing—really a blessing for movies fans with a limited budget who know they'd have to spend $40.00 and up for a viewer like it! *Sh. Wt. 4 lbs.*

16mm Mod. $17.95

8mm PROJECTION EDITING VIEWER

$6.95

You'll more than ever enjoy editing your movies when you use this neat, all-metal, electric editing viewer. It projects a clear image on the groundglass, makes possible viewing from a comfortable distance. *Shipping Weight 2 lbs.*

PORTABLE CRYSTAL-BEADED 30x40 TRIPOD SCREEN

LOWEST PRICES EVER $7.69

- Crystal-beaded Pyroxilyn surface.
- Screen raises and lowers on elevating rod, assuring positive alignment.
- Carrying handle sets automatically for balanced carrying.

Despite higher steel prices, Spiratone continues to offer you the biggest bargains in screens ever! Same quality as before, and as praised by thousands of movie and slidefans. Metal can has beautiful scratch-resistant finish. Sturdy tripod is plated and has protective rubber tips. Thousands of these screens are in use, not only by amateurs, but by clubs, churches, colleges as well.

Screen Size		Ap. Sh. Wt.
30"x40"	7.69	10 lbs.
40"x40"	9.16	11 lbs.
37"x50"	10.64*	14 lbs.
50"x50"	12.97*	15 lbs.
52"x70"	24.95*	

*Screens are shipped by us Express (freight costs collect) within U.S., other screens P.P. or Express.

40 x 40 SILVER TRIPOD SCREEN $12.95

½" f1.9 NORMAL FOC. MOUNT 8mm LENS

$12.95 PLUS YOUR LENS

Whether you own a Keystone, Revere, Cinemaster, Dejur, B&H Sportster or Companion 8mm camera, you can now trade your normal (12½ or 13 mm) slow f.2.5, 2.8, 3.5 lens for a brand new coated ½" f.1.9 lens with clickstops in one foot to infinity focusing mount! You can still set this lens at 10 feet and use its depth of field like a 'fixed focus', but closeups can be accurately focused and distant shots will be sharper, too. When you bought your new camera, you would have had to pay $25.00 or more extra for such a lens! ½" f.1.9 lens without trade-in $19.95. Screw-in filterholder

Aux. Wideangle Lens, screws into ½" f.9, makes a 1.9 Wideangle when needed, only $4.95

1" F:1.5 NORMAL FOC. MOUNT 16MM LENS
$29.95 Fits all C-Mount cameras, accepts 21.5mm filter, coated—colorcorrected. Reg. $54.95.

65mm WIDEANGLE for 2¼ x 3¼ $19.89

- 9 speed Compur Rapid shutter, to 1/500, with X synch for flash and strobe.

Another Leitmeyr-made wideangle lens, 65mm f.6.8, covers about 85 degrees on the 2¼x3¼ negative. Its symmetrical construction permits use of either half of the lens as a 130mm telephoto. Lensboard for Graphic (state model) $2. *Shipping Charge 25c*

IMPORTED 35MM FILMS

for the discriminating black and white photographer
Your choice of these nationally advertised European films: Ilford HP3, ASA 125, Adox KB14, ASA 16, Adox KB17, ASA 32, Adox KB21, ASA 80. *Shipping Charge 10c*

20 exposure roll 65c — 3 or more (may be assorted) 55c each
36 exposure roll 95c — 3 or more (may be assorted) 85c each

35MM ANSCOCHROME

ANSCO CHROME

20 exp. reloads, in metal cartridges, ea. $1.50
3 for $4.19; 7 for $9.50.
Ship. Charges 5c, 10c, 25c.

TRIAL SET: 20 exp. Anscochrome reload, chemicals for processing, all for $2.62
Ship. Chge. 25c

ASA 32—DAYLIGHT

OFFER "A" 28 ft. roll, in Easy loader, makes 8 — 20 exposure rolls, incl. proc. by us. ... $14.95
Shipping Charge 30c.

OFFER "B" 28 ft. roll, in Easy loader, 8 cartridges, Qt. size Developing Kit, 160 glassbinders.
Shpg. Wt. 6 lbs. $14.95

FRESH SAFETY KODAK B&W FILM

All four popular speeds, Panatomic X (Background X), Plus X, Super XX and Tri-X are available in 27½ ft., 50 ft. and 100 ft. lengths and 20 and 36 exposure reloads.

27½ FT. $1.39 — 50 FT. $2.29 — 100 FT. $3.98
Shipping charges 10c, 30c, 30c

COMBINATION SPECIAL
Daylight loader with 5 cartridges and 100 ft. of black & white film, a $9.99 value $7.99
Shpg. Wt. 4 lbs.

BLACK & WHITE RELOADS
in metal cartridges may be assorted
20 EXP. 40c ea. 6 for $2.00 — 36 EXP. 60c ea. 4 for $2.00
Shpg. Chgs. 1 or 2 5c; 3 to 6 20c; 7 to 12 35c.

ALL YEAR B&W ASSORT.
Daylight loader with 5 cartridges plus 27½ ft. each of Panatomic X, Plus X, Super XX and Tri-X $10.49

ANSCOCHROME INCLUDING PROC FOR ASA 128

35MM 20 EXP. $2.59 ppd. 3 for $7.50
120 OR 620 $2.39 ppd. 3 for $6.80

Spiratone is proud to be first to offer the new Anscochrome with the revolutionary speed-increasing processing described in the June '55 issue of "Photography," enabling you, for the first time, to take fast action shots, shoot in poor light, as you would with a fast B&W film!

35mm DAYLIGHT LOADER

INCLUDING 5 CARTRIDGES
$4.95 IF PURCHASED TOGETHER WITH MINIMUM OF $7.95 WORTH OF BULKFILM.

It's so simple to take advantage of the exceedingly low cost of 35mm bulkfilm and to load any desired length into a standard Eastman cartridge. First few reloads already make loader pay for itself. Loader alone with 8 cartridges, $5.95. *Sh. Wt. 4 lbs.*

DELUXE LOADER, with automatic counter, accepts also Leica, Contax cartridges — $10.95 or add $5.00 to comb. offers.

FREE FILM TONGUE CUTTER with your order for $5.00 or more of bulkfilm, or $4.25 worth of bulkfilm plus loader. For perfect shaping of tongue to assure smooth loading. Must be requested at time of purchase.

SAVE 50% BODY, REAR & LENSCAPS SCREW-IN BAYONET

- For Leica, Canon, Kine Exakta, Praktica, Contax S, D, DA, Exa.
- All caps precision machined aluminum.

$1.00 ea. 3 (asstd.) $2.69

BODY CAPS protect camera body, shutter, when lens is removed. REAR LENS CAPS are a must for all your extra lenses. And FRONT LENS CAPS make perfect seal against any harm to optics, cannot fall off. Available for Sonnar, Biotar, Primoplan, Westar, Tessar, Triotar—be specific when ordering. *Prices on other Front Caps on request.*

Exclusive Spiratone Values!

LEATHER GADGET BAGS

Made by the foremost manufacturers in the field, and exclusively offered by us, through a special purchase, below or close to the usual wholesale prices. These bags are all brand new first class merchandise not to be confused with "seconds" or "closeouts" of inferior leather bags. *Shpg. Wt. of Gadget Bags; 3, 4, 6, 6 and 6 lbs.*

The SP1 and SP2 bring within the reach of every photographer ample size leather gadget bags, with large outside pocket, adjustable shoulder strap, rich saddletan shade, solid brass hardware, and an adjustable inside partition.

SP1 measures 7x9¼x4¼ and is priced at half of list $4.89

SP2 measures 8½x10½x4" and stands comparison with $15.00 to $20.00 bags. $6.89

SP5. A topgrain pigskin bag for the advanced amateur or professional, large enough for press cameras (10" x 12" x 5"), or for taking "both cameras" along. "Wraparound" zipper, flashgun holder, shoulder pad. If you couldn't afford that $30.00 bag, you won't pass up the SP5 at a 54% saving. $13.95

SP6. An over-sized genuine cowhide pressbag, 10½" x 14" x 5", largest size available in gadget bags costing normally $40.00 to $50.00. Adjustable strap runs around bottom of bag—no equipment too heavy for this bag! Inside cover is a batterycase holder, on sides are one large pocket for meter, two small ones for filters. Adjustable inside partition. Back and bottom are fibreboard lined for extra support. We'd bet you'd only expect to pay that little only for a plastic bag, for the cowhide SP6 is only $16.95

SP6X-PANDO, the Spiratone miracle bag that G-R-O-W-S, always making room for new equipment. Same size as the SP6 when X-PANDO zipper is closed, you can add a full 4" to the bottom width, an 80% increase is needed! $19.95

CLOSEUPS ARE SIMPLE

and inexpensive, when you buy your closeup accessories from Spiratone, the only firm specialized in low-cost closeup photography equipment.

GOOSENECK LIGHT ATTACHMENT $5.95

With C clamps, fits copy stand or enlarger pole. 2 bullet reflectors, $1.00 addl. *Sh. Wt. 4 lbs.*

FREE with orders over $3.00, or send 25c for CLOSE-UP DICTIONARY . . . Contains all needed tables, too.

DELUXE COPYING STANE

Designed by us for use in conjunction with closeup lenses, extension tubes, bellows attachments, to complete with a moderate investment, your closeup and copying equipment. Strong enough for a 4x5", yet compact in storage (two-piece post) and equally well suited for copying, medical, scientific work and movie titling. Camera bracket permits centering of camera over subject. 15x18" baseboard is very practical for large originals, 1½" diameter pole is 38" high. *Shipping Weight 11 lbs.* $9.95

EXTREME CLOSEUP LENSES

can be used with any camera—with the greatest of ease and with no extra accessories. You can get as close as 8" with a Plus 4, 7" with a Plus 5, 5½" with a Plus 6, 3½" with a Plus 10. You can use two extreme closeup lenses, with a double retaining ring, for even more extreme closeups. With a Plus 5 lens, you can fill the complete 35mm frame when reproducing a postcard; a Plus 10 lens is just right for insects, stamps and coins. Extreme Closeup lenses make macrophotography possible with a tiny investment. All exc. Plus 10, mounted in metal rings.

	Ser. V	Ser. VI	Ser. VII
Plus 4	1.75	2.00	3.25
Plus 5	1.95	2.30	3.75
Plus 6	2.25	2.75	4.25
Plus 10	2.85	3.25	5.25
Dbl. Ret. Ring	.85	.95	1.50

CLOSEUP (Portrait) LENSES

bring within every photographer's reach subjects which would be too small if photographed at the regular 3 ft. closest camera setting. Head and shoulder portraits, children's pictures, copy work—a whole new field of picture taking. All Closeup Lenses are mounted in metal rings. Deluxe lenses, made by nationally famous manufacturer, have diopter power engraved on rings.

	Reg.	Deluxe
Ser. IV		1.15
Ser. V	1.00	1.30
Ser. VI	1.25	1.50
Ser. VII	2.00	2.00

Plus 1 focuses from 38" to 20", Plus 2 from 20" to 13", Plus 3 from 13" to 10"—for versatility, you will want set of all three Closeup Lenses. *Shpg. Chgs. 1-4—10c.*

6-PC. EXTENSION TUBE SET

for Kine Exakta, Exa. This set contains two precision-fitted brass adapters and four tubes, 5mm, 15mm, 30mm and 45mm, providing the greatest possible range of closeup work from a 3.4 reduction to a 2.2 magnification ratio. *Shipping Charge 35c.*
Same set but with one FOCUSING TUBE from 40mm to 55mm, alone a $10 value. Complete set $11.50
Economy 5-pc. set, 3 tubes, 2 adapters $4.98. $7.95

4-PC. EXTENSION TUBE SET

for Praktica, Praktiflex FX, Contax, S, D, DA, Pentacon $6.95

This exceptionally well-made set includes in addition to the usual 5mm, 15mm and 30mm tubes a 45mm tube, thus permitting up to 2X magnification, when the complete set is used: a tiny object, ½" x ¾" can be made to fill the entire 35mm negative or transparency! *Shipping Charge 35c.*
Same set, but with one FOCUSING TUBE, alone a $10.00 value, increasing maximum extension to 100mm. $9.95
Economy 3-pc. set $3.98

LEICA, CANON 4 PC. EXT. TUBE SET, INCL. ONE FOCUSING TUBE, $18. VALUE $10.75

PROXISCOPE SR. $4.95

With elevating action

An absolute must for any kind of closeup and copy work. Doubles up as perfect elevating attachment, with both tripod and camera fittings for horizontal as well as vertical fastening of camera. *Shpg. Chg. 35c*

- A deluxe version of the most useful camera accessory for every practical photographer.
- Permits minute adjustments in a 4½" range on its geared track, with a positive lock at any desired point.

RF-COUPLED CLOSEUPS WITH YOUR ARGUS C3 $2.98

Proxifocuser couples closeup lens to rangefinder, corrects for parallax, makes focusing to 10" foolproof and rapid. Just place Proxifocuser over view and rangefinder (no installation), place closeup lens into filterholder—and you are ready to take portraits, copy pictures and documents, photograph flowers and small animals. Nr. 1 (to 20"), Nr. 2 (20" to 13"), Nr. 3 (13" to 10").

Each Proxifocuser, regularly $4.95—now complete with Series V closeup lens, 2.98, all three, reg. $14.85—now $7.98
Series V screw-in filterholder for filters and closeup lenses $1.25
Set of 3 metal extension tubes for Argus C3, for extreme closeups, with necessary table showing settings $5.95
Set of all three Proxifocusers, including three closeup lenses, plus three extension tubes, for complete focusing range from 36" to 2" $11.75
Shipping Charge, each item 10c

2x2 ALL METAL SLIDE FILE $1.99

2 for 3.79
4 for 7.49

Accommodates 300 redimounts or 150 glass-slides. Slots prevent rattling. Index. Clamp lock and handle. *Shipping Weight 3½ lbs. each.*

SEQUENCE MODEL, holds 300 glass or 600 redimounts in groups, with metal dividers—same low prices!

USEFUL ACCESSORIES

FAMOUS MAKE **PHOTO ELECTRIC EXP. METER**

- Sensational import from Germany!
- Sturdily constructed, with super sensitive electric eye for maximum range!
- Settings from 1/1000 to 60 sec, f:1 to f:22, ASA 4 to 250.

A $15.00 VALUE $5.59 WITH ER CASE

Most compact—2" x 3" x 1" and light. 4 oz. Snap open protective cell cover, set desired shutter speed opposite pointer—and you are ready to read off correct opening for your film. One hand operation. One year guarantee by Spiratone and manufacturer. *Shp. Cost 10c*

METAL SNAKE CHAIN $1.29

FOR EXAKTA, LEICA, RETINA, PONY AND OTHERS
Smoothly suspends camera at chest height for worry-free carrying without case! Elegant, practical, safe and luxurious—at half the usual cost. *Shipping Charge 10c.*

KING SOL SOLENOID $5.59 ppd

Assures perfect synch at all speeds with Graphic, Busch, Croflex Rapax, Rollei—the professional way. Instructions for press camera installation supplied—others have mechanic install. Was $15.00!

TIME EXPOSURE & DELAYED ACTION NOW ADDED TO EVERY CAMERA

AUTOKNIPS II WAS $4.95 $2.95

This most popular of all self timers in conjunction with a cable release, adds to your camera a feature many a photographer has paid a small fortune for: 11 slow speeds from ½ a second to ten seconds! *Ship. Cost 10c*
CABLE RELEASES: 4" 25c 7" 35c 10" 45c 40" $1.25

SYNCH YOUR OLD CAMERA

- Fully adjustable mechanical tripper, requires no installation, works through standard cable release socket of most old cameras. Has fitting for standard flash cord.
- Allows adjustment for flash bulbs and zero (X) delay for Strobe.

$2.49 PPD.

Tripper with famous make all metal flashgun (Flashgun only is $6.95 value, has bracket, accepts screw base bulbs; bayonet base adapter 30c) *Shipping Weight 2 lbs.* $4.95

KOILED FLASH CORD $1.98

- Now available for most shutters. *Sh. Chg. 10c*
- Patented coiled cord extends to 3 ft., yet coils up without effort to only 7".

So handy when you want to hold flash away from camera, place electronic flash closer to subject than camera! Available with standard polarized household type plug for Heiland, etc., and prong type for Kalart to fit Compur, Prontor S, ASA (Kodak) Solenoid, Argus C3, C4, Nikon, Realist, Praktiflex, Bolsey and Exakta synchronized terminals.

10 FT. CABLE RELEASE $4.49

with setscrew and booster spring

A sturdily constructed German cable for remote control work to operate with any Kodak or Compur type shutter. Imagine the many new possibilities this release opens up for you—whether you photograph wild animals, unsuspecting children at play or take a self-portrait, you'll find this release a valuable accessory. (Leica model add 25c.) *Shipping Cost 25c.*

Other long Cable Releases with setscrew:
40" $1.50 60" $2.50 20 ft. $7.95 40 ft. $12.49

Up to 70% off! 2x2 Color-Slides for as little as 3c!

2 x 2" 10 PC. N'ATL. PICTURE SLIDE SETS

Yes, these famous sets of 2 x 2" full color slides of which hundreds of thousands have been sold at $1.00 per 10 are now brought to you at less than half price! Scenics from all over U. S. and many foreign countries, and children's stories. Each number contains 10 dif. slides. Choose from these:

1. Shrines, Wash., DC
★ 2. N. Y.'s Hudson River
3. Rodeo in Calif.
4. Block Island
★ 7. From the Empire State Bldg.
13. Bryce Canyon
15. Washington, D. C.
18. Big Bend Nat'l Pk.
21. Hialeah Racetrack, Florida
25A. California
27A. N. Y. Midtown
28. NYC Financ'l Dist.
★30. Great Smokey Mts.
31. Chicago, Illinois
★32. Notre Dame Univ.
★34. Colorado & Estes Nt'l Park
★35. Kansas City, Mo.
★39. Wisconsin Dells
★40. Atlantic City, N. J.
★40A. Atlantic City
44. Mackinac Isle Mich.
47. Hoover Dam
60. Madrid, Spain
★70. Ireland
71. Blarney Castle, Ireland
★80. Rome, Italy Landmarks
81., 82., 83. Rome, Italy
★85. Vatican City, Religious Shrines
★87. Inside Vatican City
★88. Genoa & Columbus
101. Cairo, Egypt
★110., ★111. Bombay, India
120., 121. Lisbon Portugal
130. Alaska
151. Istanbul, Turkey
160. Athens, Greece
★180. Mexico, Tourist Paradise
★181. Touring Mexico
191. Havana, Cuba
★206. Newfoundland
208. Australia
211. Haifa, Tel Aviv, Israel
A2, A3. Brookfield Zoo
P4. Ice Capades
C-11. Snow White
★C-12. 3 Caballeros

All slides have subject matter imprinted.
Any two sample sets (20 slides) $1.35 ppd.
Any 4 sets (40 slides) $2.40 — Any 8 sets (80 slides) $4.00
Shipping Chges. 4-6 10c, 8-12 30c

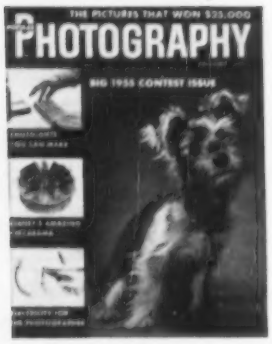
SAVE EVEN MORE ON
Special Slide Assortments:
Any 10 sets (100 slides) marked ★ — 3.25
All 20 sets (200 slides) marked ★ — 5.75

All prices include excise tax. Postage and insurance MUST be prepaid, even when no shipping weight is stated — overpayment will be credited in full. Everything listed is brand-new (unless otherwise stated) and fully guaranteed against defects. 25% deposit on C.O.D.'s. Items marked 'Free', 'Premium' or 'Bonus' MUST be requested at time of purchase. Foreign orders welcome — slight extra handling charges apply.

SPIRATONE INC.

49 WEST 27th ST., NEW YORK 1, N. Y.
SEND MAIL ORDERS TO:
135-06 NORTHERN BLVD., DEPT. P1 FLUSHING 54, N. Y.

SAY MERRY XMAS WITH



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POPULAR PHOTOGRAPHY

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a library of all types of background music and people experienced in making suitable selections. The music used by these studios has already been cleared by ASCAP. All you pay is a license fee of $15 for U. S. and Canadian rights, each time the needle is put on the record. The charge for world rights is $25. For a 10-minute film you can figure five selections will cost from $65 to $100.

You are not allowed to use popular recordings in a commercial film. If you use a tune not in the popular domain, recorded by your own musicians, you must obtain a license, the cost of which is determined by the publisher of the tune. For such a license, write to the publisher or his agent giving full particulars as to purpose, length, and use of the film.

The cost of selecting, recording, and mixing with narration of background music (plus sound effects, if used) is usually based on time spent. As an average, you can figure on $170 plus $55 for developing the sound track, making a total recording charge for a 10-minute film of approximately $300, excluding music rights and narrator's fee.

Making the duplicate

While the sound track is being developed, you can begin editing the original according to the work-print, using the edge numbers as a guide. Since this editing is a time-consuming job, you may want to have it done on the outside. Most laboratories have editing facilities and guarantee splices to hold during printing. If the film includes transitions, the editing must be done on so-called A and B rolls, about which more details can be had from the laboratory. Some laboratories charge a fee of about $50 for 400 feet plus $2 to $4 for each transition. Others charge a higher fee for editing, but offer an unlimited number of transitions free. In either case, I feel the charge is reasonable.

Never order more than one print at first. The laboratory can control and change colors and densities in various scenes to a certain degree, so examine the first print carefully with your customer and recommend desired changes to the laboratory before ordering prints.

Duplicate prices vary somewhat and are also dependent on the quantity of prints ordered. An average fee is: black-and-white, first print 11 cents; additional prints 4 cents; color, first print 17 cents a foot or $68 for 400 feet, additional prints, 15 cents a foot or $60 for 400 feet.

I would suggest having the laboratory store the original in its fireproof vaults.

Copyright

A film can be copyrighted by sending two prints of the film to the Library of Congress, together with an application Form M, which can be obtained from the Register of Copyrights, Library of Congress, Washington 25, D. C. The copyright fee is $4. The prints may be in black-and-white, even if the final version is in color. The question of whether to copyright should be decided in advance for the year and name of the copyright owner must appear in the main title. It should read: Copyright, 1954, John Doe Productions.

Making a commercial film can be a profitable challenge. Try one!—

contests and markets

CONTESTS

AMERICAN MUSIC CONFERENCE has announced its contest to choose six winning photographs of amateur musicians participating in their hobby. Top prizes are $250, $150, and $100, along with three $25 prizes. Payment of $10 will be made to any non-winners whose photographs are used for publicity purposes. Contestants may enter an unlimited number of photographs of any size before the contest deadline, January 15, 1956. Submissions, as well as requests for further information, should be sent to: Photography Contest, American Music Conference, c/o the Philip Lesly Company, 100 W. Monroe St., Chicago 3, Ill.

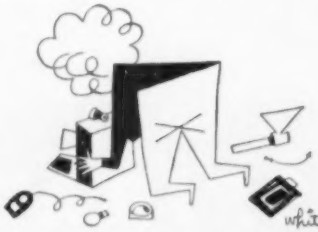
CLAYTON CHEMICAL & PACKAGING CO. has announced a contest featuring pictures processed in any Clayton chemicals. The contests is open to all residents of continental United States over 16 years of age. Size or number of prints is not restricted and photographs will be judged by experts from leading photographic publications on the basis of composition, interest, and quality. An entry blank or replica thereof, or a sales slip for Clayton chemicals must be attached to every entry. First prize in the contest is an all-expense-paid trip to Paris for two via TWA for two weeks. The next five prizes are $150 in cash to the photographer with $50 in cash to the camera club of his choice; five additional prizes will be $75 to the photographer with $25 to his designated camera club. All entries must be sent to Clayton Chemical & Packaging Co., 5420 N. Damen Ave., Chicago, Ill., on or before the closing date, February 1, 1956.

THE ELEVENTH ANNUAL NATIONAL HIGH SCHOOL PHOTOGRAPHIC AWARDS has been announced to all high-school students (grades 9-12) in the US and its territorial possessions. An unlimited number of photographs may be entered within the contest's four classifications: School Activities, People, Pictorials, and Animals and Pets. Over 250 prizes will be awarded: the top award in each class will be $300, and second and third prizes are $200 and $100, respectively. There will be four additional awards of $50 each with 240 awards of $10. Entry blanks and constructive tips on contest photography are available from the National High School Photographic Awards, 343 State Street, Rochester 4, N.Y., for the contest which ends March 31, 1956.

MARKETS

AUTO LAUNDRY NEWS is looking for amateur photographers throughout the United States who can supply them with photographs of minute-car-wash establishments. Prices from $5 to $25 will be paid, depending on the use of the prints. Send prints and requests for further information to Mr. Robin King, editor, *Auto Laundry News*, Capuchinas 55, San Jose, Insurgentes, Mexico 19, D.F.

STAMOS PHOTOGRAPHY SERVICE, 100 Oxford Ave., Buffalo 9, N. Y., is looking for cheesecake photographs in both black-and-white and color. $5 will be paid for accepted black-and-white prints no larger than 4x5 and $10 for 2x2 color transparencies. Exclusive rights are not required and unused material covered by postage will be returned.—



Start saving in 1956 Start BUYING FROM SUPREME NOW!

8mm & 16mm MOVIE FILM

1956 Date • ASA 50

8mm x 25′ Dbl. ..... 3 for **3.95**
16mm x 50′ Mag. ..... 3 for **6.75**
16mm x 100′ Roll ..... 3 for **8.50**

SUPER-SPEED 160 ASA
1957 Date

8mm x 25′ Dbl. ..... 3 for **6.50**
16mm x 100′ Roll ..... 3 for **15.00**

ALL WITH FREE PROCESSING INCLUDED

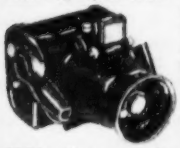
Fresh ANSCOCHROME 1956-7 • ASA 32

(outdoor or indoor)

120 or 620 ..... 3 for 3.50
35mmx20 exposures ..... 3 for 3.95
35mmx28′ with loader ..... each 8.50
Processing not included
16mmx50′ mag. ..... 2 for 11.50
16mmx100′ roll ..... 2 for 16.75
Ansco Processing included

K-20 AERIAL CAMERA

with 6⅜″ f/4.5 lens



Most wanted camera of its type. Rapid sequence action on 4x5 negative. Trigger shutter release. Speeds to 1/500th sec. Manual operation. Gov't cost over $800.

FULLY GUARANTEED

FREE with camera: 2 rolls Super XX; 2 rolls Infrared; 1 roll Ektachrome. **149.50**

Ansco COLOR CUT FILM (1955 Date)

Daylight or Tungsten

4x 5—20 sheets **4.00**
8x10—10 sheets **5.50**

Ansco PRINTON

8x10—12 sheets **5.95**

ENLARGING PAPER Dated 1956

5x7 **HALOBROME**
DW Semi Matte #2, 3
200 sheets **4.25**

8 x 10 HALOBROME • CYKORA KODABROMIDE

SW Glossy #1, 2, 3
100 sheets 3.75
200 sheets **6.95**

8x10 **HALOBROME**
DW Semi Matte #2, 3
100 sheets **3.75**

8x10 **RESISTO RAPID**
"For Fast Drying"
Semi Gloss #1, 3 125 sheets **4.25**

8x10 **BROVIRA VELVET**
DW #1, 2, 3, 4 125 sheets **4.75**

11x14 **KODABROMIDE & HALOBROME**
SW or DW White Lustre #1, 2, 3, 4
(Specify) 100 sheets **6.75**

NEW! IT'S TERRIFIC!

KODAK INFRARED • 1957 Date
For most unusual effects day or night
HIGH SPEED 120 or 620
100 ASA 10 rolls **3.29**

Newest type Fresh KODACHROME 1956-7 Date

(outdoor or indoor)

35mmx20 exposures ..... 3 for 4.75
35mmx36 exposures ..... 3 for 6.25
Processing not included
8mmx25′ roll ..... 3 for 8.95
8mmx25′ mag. ..... 3 for 10.95
E.K. Processing included

35mm x 100′ SAFETY FILM

Guaranteed till Dec. '56
Super XX, Plus X
Infrared, Bkgrd. X
Ansco Supreme
1.95 each
(Loaded in daylight loading spools in metal cans).

TRI-X 1956 Date
Fresh quality guaranteed **4.95 each**
Positive film 1.50

BULK LOADER
10 cartridges included FREE! **4.95**

"January — Best Buys"

MICROFILE or PLUS-X 10 for **2.95**
35mm x 36 exposures
Original factory packed cart.

AERO ENLARGING ROLLS
9⅜x200′ #1 Wt. 18 lbs. 2 rolls **5.25**

14x17 Developing Trays **10.50**
White porcelain coated. Wt. 8 lbs.
3.75 each • set of 3 for

VARIGAM

10x10 S.W. Semi Gloss 125 sheets 3.75
11x14 S.W. Semi Matte 50 sheet 3.50

HALOBROME

5x7 DWGL #1 200 sheets 2.95
8x10 DWSM #1 200 sheets 3.95

35mm COLOR

Ansco Tungsten 50′ **7.25**
Ansco Daylight 28′ **6.95**

35mm x 20 Exposures
Ansco—Daylight or Tungsten **6 for 4.99**

35mm aero EKTACHROME
(6 empty cartridges FREE with any of above) **40′ for 5.00**

CONTACT PAPER

"Below wholesale cost"

20″x24″ Resisto No. 2, 3, 4
144 SHEETS **5.50**
weight 20 lbs.—shipped railway express

4x5 HALOID SWGL No. 2, 3, 4
300 SHEETS
8x10 SWGL No. 1, 2, 3
100 SHEETS **2.50**

KODAK Lt. Wt. FLEXIBLE
For Making French-fold Christmas Cards
8x10 #1, 2, 3, 4 250 sheets 3.75

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Sent on Request.
Write Today!

- **BIGGEST** Values and Selection
- **BEST** Quality and Service

ROLL FILM (1956 Date)

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Flash Equipment

(Continued from page 44)

ter is tripped, the moving blades close the flash circuit which fires the bulb.

Solenoid—This is an electromagnet, a sort of electrical finger, which is connected to the shutter-release lever. Solenoids are used only for synchronization with between-the-lens shutters, and are usually found on press and view cameras where the lensboard is not permanently attached to the camera body.

Mechanical—This is usually a cable-release arrangement which screws into the cable-release socket of the camera shutter and connects to the firing switch of the flashgun. Synchronization is controlled by the distance the cable release must travel to release the shutter. This type of equipment is usually used with inexpensive cameras that do not have internal synchronization and where it is not practical to use a solenoid.

Combination solenoid and internal—In this method, a solenoid is used to trip the shutter, and the internal synchronization in the shutter fires the bulb.

The flash unit has three other parts—the reflector, the cord, and the mounting bracket.

The reflector is used to concentrate and direct the light. Its efficiency is determined by its size, shape, surface finish, and the position of the bulb in reference to the reflector surface.

The cord carries the current from the batteries to the camera. Cords are of various designs and shapes, but all have two wires with plugs at the ends for attaching to the gun and camera. In the simpler box and folding cameras, the cord has been eliminated, and the contact is made through metal plates which come into contact when the gun is attached to the camera's mounting bracket.

The mounting bracket, or shoe, provides a means of attaching a flashgun to the camera. Actually, there are three ways of doing this. The first is by direct attachment which does not permit removal of the gun for off-camera flash. The second employs a simple bar which is threaded for attachment to both camera and gun, and the third is a quick-release bracket permitting quick detachment of gun from camera with a single, simple motion.

Other pieces of equipment used extensively in flash photography are the extension unit, the slave unit, and the remote tripper control.

(The light stand—manufactured in a great variety of lengths and weights—is a basic part of setups utilizing extension units.)

The extension is simply a reflector and socket with a long cord which can be plugged into the flashgun. Most guns have sockets built into them for this purpose.

The slave unit is a self-contained flashgun, usually of the B-C type, with a photoelectric cell built into it. When the light from the bulb in the gun strikes this cell, it fires the bulb in the slave unit. These units are designed so one or more extensions can be plugged into them. They are used where the photographer wants to fire bulbs at considerable distances from the camera without using long lengths of wire.

The remote-tripper control is simply a switch at the end of a long electric cord. When it is plugged into the gun, the gun's regular firing switch is by-passed, permitting firing from the switch at the end of the cord. This type of control can only be used with guns having a socket built into them for this purpose.

Now, let's discuss flash bulbs.

The primary purpose of flash equipment is to fire the flashbulb and to time it so it will be burning at its brightest when the shutter is open at its widest. In simple terms, a flashbulb has been described as "a bonfire in a bottle." Bulbs are classified as to the length of time it takes to ignite and burn. Although the flash from a bulb seems to be instantaneous, it actually is not. When a bulb is fired, the filaments inside it ignite the combustible material. This material starts to burn at the center, and as more and more of it burns, the light from it gets brighter until it reaches what is called the peak, that is, when it is burning at its brightest. Then the light starts to diminish until it goes out. This time can be measured accurately to the 1/1,000 of a second or millisecond, which is abbreviated ms.

The four types of bulbs are:

Class F or fast-peak, which are burning at their brightest about 6 ms after they are fired.

Class M, or medium peak, which reach their brightest in about 20 ms.

Class S, or slow-peak, which reach their brightest at about 30 ms.

Class FP, focal-plane, which reach their peak in about 20 ms, and then continue to burn for approximately another 20 ms.

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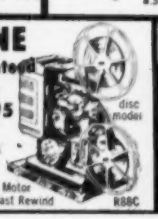

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These bulbs are designed for use with cameras having focal-plane shutters. They burn long enough for the light to reach all parts of the film as the slit in the shutter travels across it.

(For full information on bulbs see chart on pages 98-99.)

In addition to firing the bulb, the flashgun is sometimes used to trip the shutter of press and view cameras equipped with a solenoid. The design of these cameras usually makes the shutter release awkward to reach, especially if they are being hand-held. By firing them with a flashgun, the photographer is able to hold the camera steady and concentrate on the picture he is after rather than having to grope for the shutter release.

Every photographer has, at one time or another, had trouble while using flash. Elsewhere in this story is a *trouble-shooting chart* which lists problems and causes of flash failure. It should be of great value in checking your equipment.

The most common cause for equipment failure can be traced to the batteries.

This is easily understood if you will remember that the batteries are the power source which makes the equipment work.

There are four battery sizes used in flashguns. The "AA" or penlight cell, the "C" cell, the "D" cell, which is the same size as a regular flashlight battery, and the 22½-volt "B," which is used in most B-C units.

To work well, batteries should be fresh and up to strength. Freshness can be insured by looking at the date stamped on each battery, and the strength should be checked with an ammeter. Most stores keep one for this purpose and they will be glad to let you use it.

On the meter, the penlight or "AA" cell should register approximately five amperes when new and should be discarded when it shows one and a half amperes or less. The "C" cell is designed to produce seven amperes when new and should be discarded when it records two or less.

These two types of batteries are smaller than the regular flashlight cell and are used primarily in inexpensive cameras and small two-cell flashguns. Most manufacturers recommend they be used only to fire flashbulbs, and that they not be used with extensions or with a solenoid.

The "D" battery is designed to produce 16 amperes when new and should be changed when it registers five or less amperes. This battery size is recommended when operating a camera equipped with a solenoid.

The 22½-volt "B" battery is checked for its voltage rather than its amperage. At present, no meters designed for checking them are available to the average photographer, although one of the large manufacturers of dry-cell batteries expects to have one on the market in the near future.

One note of caution: Never leave a meter connected to the battery for more than a few seconds. Otherwise, the closed circuit will tend to weaken the cell very quickly.

In an emergency, it is possible to check battery strength with an ordinary flashbulb. Put the batteries into the flashgun, disconnect the cord from the shutter and short the cord contacts. The bulb will fire if the circuit is complete and the batteries are up to strength. *(Note. This test is effective only when equipment is used with cameras having internal synchronization. The batteries may be strong enough to set off the bulb and still not have enough power to fire both the flashbulb and the solenoid.)*

Here are 10 tips which might save you from failure.

1 Whenever possible, use batteries designed specifically for photoflash work, rather than those intended for use in a flashlight.

2 When putting batteries into a flashgun, scrape both the top and bottom to insure a good metal-to-metal contact.

3 When inserting 22½-volt "B" batteries into a B-C unit, be sure you have them pointing in the right direction. The positive and negative poles are marked on the battery itself, and most B-C units are marked to indicate which end goes where. If the battery is put in backward, the unit will not work.

4 If you are planning on making a lot of flash pictures, try using two sets of batteries instead of one, rotating them frequently. This will add considerably to their life as it will give the cells a chance to recover somewhat from the workout they received.

5 Batteries tend to lose their strength when cold. If you want to use flash outdoors on cold days, try to keep your camera and flashgun warm, either by bringing them out of the house just before you shoot, or by keeping them under your coat.

6 The shelf life of a battery can be extended for some time if it is stored in a refrigerator. It should be well wrapped to keep it from getting damp, and should be removed five or six hours before use so it will have time to warm up to room temperature.

7 Most flash-battery cases can be converted to B-C operation by inserting a standard B-C unit. In the case of three- or four-cell flashguns, it will be necessary to put in regular "D" cells to fill up the empty space as well as to complete the circuit in the gun.

8 Never store a flashgun with the batteries in it. Remove them before storing, because they may swell and burst, causing the interior of the gun to become corroded and ruined.

9 If there is a must picture, and your batteries are too old to do the job, try putting them into a warm oven for a couple of minutes. This will give them enough life to squeeze out a few more shots. The charge will stay in the batteries only a short time, and one heating is about all you can give them and still get results.

10 Another way to get a few extra shots out of weak batteries is to punch a couple of small holes in the bottoms and let them stand in a tray of water for a short time. After this, dry them off, and put them into the gun. Make your shots, remove the batteries *immediately* and clean out the gun with a dry rag. If the batteries are left in the gun, they will corrode the case and possibly ruin it completely.

The second common cause of trouble with flash equipment is a broken or shorted flashcord.

This usually makes the equipment work erratically in that it will sometimes operate and at others it will not. The break usually occurs where the plug is attached to the cord. What happens is that the insulation around the wire holds the broken ends together part of the time and lets them slip apart at other times.

If your batteries are up to strength and the bulb fires when a solenoid-equipped camera is in use, it is a pretty safe bet the trouble is in the cord. With cameras having internal synchronization, the bulb will not fire at all if the cord is broken.

In some types of armored cable a breakdown in the insulation properties of the cord's covering will cause trouble. That is, the insulated core between the two wires deteriorates and the current drains between them. This drain is slight, and for the most part cannot be detected with instruments. The result of such a breakdown is that the batteries will be drained of their power very quickly.

The third major cause of trouble is loose or dirty contacts.

Photoflash batteries do not have a great deal of power. The resistance of wires, plugs, solenoids, and other parts is high. If it is too high, equipment won't work.

Periodically, clean all contacts and tighten all screws. Before using a flashbulb, scrape the base against the sole of your shoe, or a small tab of sandpaper glued to the bottom of the flashgun case. This will remove any oxidation and insure good contact. (Warning, do not make a habit of wetting the base of the bulb with your tongue. This can cause a chronic irritation of the tongue.)

Many guns use either a coiled or flat spring at the bottom of the bulb socket to make contact with the bulb's base. With use, these springs tend to become compressed and no longer make positive contact. If the spring shows signs of compression, merely pull it up—stretch it. It won't have great tension, but will work.

The fourth reason for trouble with flash equipment is improper synchronization of the flashbulb and shutter.

The commonest cause of such a failure is weak batteries. They produce so little heat in the bulb's firing elements that the bulb does not go off until the shutter is already closing or closed. Where a solenoid is used, weak batteries may not have enough power to both fire the bulb and trip the shutter, or if they do, the electrical resistance of the solenoid may cause it to operate too slowly.

Many synchronization failures can be traced to the use of the wrong bulb. Most simple flash cameras are designed for use with either Class F, Fast-Peak, or Class M, Medium-Peak bulbs. If the wrong type is used, the flash peak will not coincide with the full opening of the shutter.

More-complicated cameras having adjustable shutter settings are usually set for a 20-ms delay so they will operate with medium-peak bulbs. With these, the flash from a fast-peak bulb would already be declining by the time the shutter started to open. Some older cameras, designed

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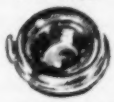

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primarily for use with fast-peak bulbs, have a lever to set a delay mechanism if you want to use medium-peak bulbs. A frequent cause of synchronization failure with such cameras is neglecting to cock the synchronizer lever when medium-peak bulbs are used and cocking the delay lever when fast-peak bulbs are fired.

Most newer cameras have settings for medium-peak bulbs and for electronic flash equipment. This setting is usually designated as "X" on the shutter. Firing medium-peak bulbs when the camera is set on "X" will again result in synchronization failure.

Synchronization troubles are also likely when a camera equipped with a solenoid is fired with a B-C unit rather than regular "D" cells. A solenoid needs a strong, steady source of power. The sudden surge of power from a B-C unit acts so quickly, however, that a solenoid designed for regular battery operation loses its timing characteristics, and merely acts as a shutter release.

There are two methods used to get around this. One requires an adjustable delay between the discharge of the B-C unit for the bulb and the discharge of the unit for the solenoid. The second method uses the solenoid merely to trip the shutter, while the internal synchronization of the shutter fires the bulb.

The first method is being used in some flashguns being sold today. The second, however, as far as this author knows, is only being used by photographers who have rigged it up themselves!

Accurate testing for synchronization can only be done with special equipment. Most camera dealers and repair shops have this equipment and will make the tests for a small charge. There are, however, two methods of testing synchronization which the photographer himself can do. One can give only a rough approximation. The other, however, will give a fairly high degree of accuracy in its results.

A quick field test for synchronization: Open the camera diaphragm all the way. Set the shutter at the speed which you plan to use, and then open the back of the camera. Put a bulb in the flashgun, and connect the gun to the camera. Find a blank spot on a wall, preferably a white one, and point both the camera and the flashgun at the wall.

Place your eye at the film plane at the open back of the camera and fire the flashgun. Through the lens, you will see the flash from the gun as it reflects off the wall. If the light has a circular shape, the shutter and bulb were in synchronization. If you get a star-shaped light pattern or no light at all through the lens, then the camera is out of synchronization. This method is very rough and should be used only in emergency situations.

Here is a second method which has a fairly high degree of accuracy and which can tell you if your equipment is in synch, firing early or late.

Lay a piece of printing paper, of any contrast, across the film plane of the camera and close the back. In the case of a press camera, load it in a holder. Open the diaphragm of the camera all the way and set the shutter for the most-used picture-taking speed—usually 1/100 or 1/200 of a second.

Remove the reflector from the flashgun and after connecting the cord to the camera, place the gun in front of and as close to the lens as it is possible and still get it in sharp focus. Insert a bulb in the gun and focus on the bulb. (It is important that the focus be as critical as possible.) Fire the camera and then develop the paper in normal paper developer. Give full development, at least 90 seconds, fix and examine.

If you find:

1—The shape of the bulb is completely black, right up to the very edges, the equipment is in synchronization.

2—The shape of the bulb is black in the center and shades off to grays at the edges, all the filaments in the bulb are not yet burning, so the shutter is firing early.

3—The shape of the bulb is gray in the center and black at the edges, the filaments in the center of the bulb have already burned out, and the shutter is operating late.

Adjusting the timing of a camera equipped with a solenoid can be done by the average photographer. The timing between the shutter and the flashbulb is controlled by how far the arm of the solenoid has to move. On most, this is adjusted by turning a screw. Adjustment is a matter of trial and error.

It is not possible for the average photographer to adjust the timing on shutters having internal synchronization because of the necessity of opening the shutter to do the work. It is recommended that a competent repairman be consulted if trouble occurs with this type of synchronization.

Here are some final tips which may prove helpful in operating your flash equipment:

1 When using extensions, be sure the batteries are strong so as to overcome the added resistance of the wires, socket, and extra bulb. The use of B-C flash is recommended when using extensions because of the heavy kick delivered when the unit discharges.

2 If you are not sure of synchronization, you can be almost certain of getting your shot by using a medium-peak bulb such as a #5 or #25 and shoot around 1/25 of a second. If your camera has an adjustment for F or fast-peak synchronization, set it on that, and figure your guide number for open flash, which is essentially what this method is. A #5 or #25 bulb fires in about 1/50 second while the shutter is open for twice this time.

3 Never jerk cords from their sockets or remove them by pulling on the cord itself. Remove them from their sockets by pulling on the plug.

4 To give proper modeling and what could be termed a natural appearance to the light, the flash reflector should be mounted higher than the camera lens, so the shadows will fall below the highlights.

5 If you make a shot and the subject says he thinks his eyes were closed, find out if the flash appeared pink or white. If it was white, you got the picture. If pink, the eyes were closed and the light was colored by his eyelids.—■

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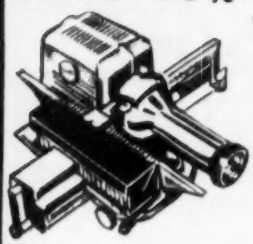

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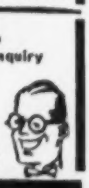

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5. Each print must have secured to it a filled-in entry blank *available only at your photo supply store.* Information requested on the blank should be printed or typewritten. Failure to provide full information on entry blanks will disqualify the print.

6. Entries will not be returned; non-qualifying prints will be destroyed immediately following announcement of the prize winners. The Contest Editor will not enter into correspondence of any kind regarding entries.

7. Prize winners will be announced in the July 1956 issue. Prize-winning prints and negatives including all reproduction and promotional rights, become the property of POPULAR PHOTOGRAPHY. Students winning prizes will be required to furnish original negatives before prizes are given, as well as model releases where necessary. All prize-winning negatives become the exclusive property of POPULAR PHOTOGRAPHY.

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Sworn to and subscribed before me this 27 day of September, 1955.

[SEAL] Victor C. Stabile, Notary Public.
(My commission expires March 30, 1957)

Simple Flash Camera

(Continued from page 52)

short cord connects the contact on the camera body to that on the flash unit. In the latter case, you can lengthen the connecting cord by merely splicing into it a four-foot length of regular lamp cord, giving you a cord long enough for those hand-held off-camera flash shots.

If, however, you have the plug-in-type flash unit, you'll have to make a cord with the proper contacts at each end to provide the connection between the camera and the flash unit.

The materials needed for both connections mentioned above are as follows:

For the connector cord (camera to flash unit):

Four ft of lamp cord
One RCA phono plug
One banana plug
Two wafer socket pin contacts (from old-type socket)

For extension-flash connection: (flash unit to extension):

Eight ft of lamp cord
One alligator clamp
One spade lug
One cord-connector tap

The lamp cord and the cord-connector tap can be bought at any hardware store and the remaining items can be purchased at a radio shop.

To make the connector cord, take the lamp cord (12 ft long) and cut from this a four-foot length. Bare the wires about one inch at each end, and twist the wire so that it remains tight. Next take one wire end, double it and place it in the open end of the banana plug, and tighten the screw on it. The remaining three contacts must be soldered. Take the RCA phono plug, put it in a vise or have someone hold it with a pair of pliers. Double the end of the wire and put it into the open end of the plug, then fill the hole with rosin-core solder and heat until it melts. You can avoid having a strain on the top connection (banana plug) or having it pull out by making the lead to the lower contact (phono plug) about an inch shorter in length.

The other two ends of the connector cord will be soldered to the wafer socket contacts. Place the wire end through one of the holes opposite the socket and while someone holds the contact with a pair of

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pliers, apply the solder to the wire and smooth it with the soldering iron. The socket end of the contact should be fitted to the prong of the flash unit and squeezed gently with a pair of pliers. For a more secure connection, the socket also may be soldered.

When using the flash unit off the camera, a small nut is screwed to the top post of the unit to hold it tight and insure a good electrical contact.

The two plugs going into the camera may be just a bit too big for the openings in the camera. In this case, use a small file or fine sandpaper to smooth each plug until you get the proper fit.

To make the extension-flash connector is a relatively simple matter, since there isn't any soldering to be done. Take the 8 feet of lamp cord remaining and bare the wires at both ends. Then take one wire end, double it, and put it into the open end of the alligator clamp and pinch the tube tightly around the wire with a pair of pliers. Next, take a small file and file down the teeth on one side of the clamp. After this is done, the toothless half of the clamp should fit snugly into (not around) the bulb release lever on top of the flash unit.

Because of the downward angle of the cord connected to the flash unit, the wire going to the slotted screw on the unit should be cut 1½ inches shorter than the wire leading to the alligator clamp. The end of this shorter wire should then be doubled and inserted in the spade lug, which is pinched together with a pair of pliers. A dime can be used to loosen or tighten the slotted screw on the spade lug.

To the other end of this 8-foot wire attach the cord-connector tap. You do this by taking the tap apart, securing the bared wires under the two screws inside, and closing the unit again. You have now made all the connections needed for a complete multiple-flash setup.

The versatility of the flash setup we have described is practically unlimited. You have on-the-camera flash, hand-held off-camera flash, and the extension-cord tap to which can be plugged three extension flashes. These four lamps may be fired singly or all together. This is possibly due to the fact that the extension flashes are in a parallel hookup with the main flash.

However, a strong current is needed to fire so many bulbs at one time and a B-C flashpack is almost a must. The B-C cartridge can build up a charge of electricity in the capacitor from a relatively weak power supply and then release this big charge all at once when the contact is closed. This method insures against bulbs firing late or not at all.

Photo by David Sutton

Illustrations for this story were made with a Kodak Duaflex III camera, which offers a choice of three apertures, f/16, f/11, and f/8. Obviously this gives greater versatility than some simple cameras have, but almost every picture could have been made with any box camera which has built-in flash synchronization.—

Multiple Flash

(*Continued from page* 66)

way, too. Photographers who take the time to set up extension flashes often take the time to work out better compositions, better expressions, better story impact.

So, then, how do we go about shooting pictures with extension flash?

The easiest way to learn to light effectively with extension flash is to think of the flashbulb as a portable sun. If your flash is right at the camera, you get the same flat lighting that you get when the sun is at your back in an outdoor picture —uninteresting, over-all illumination: no accent, no roundness, no modeling.

As the sun (or your flashbulb) moves around the subject, it begins to give character to the picture. You get highlights and shadows; you get a feeling of roundness, space, dimension. As the sun (or your flashbulb) moves farther around, this feeling is intensified, but your shadow areas may become too great and too deep.

These deep shadow areas require some supplementary illumination. Outdoors you may get this from overall sky illumina-

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262	10½	6	Cooke Aviar, I.D. flange	54.50
210	8¼	4.5	Carl Zeiss Tessar, I.D. flange	59.50
195	8	6.8	Schneider Doppel Anagt., barrel I.D.	24.50
165	6½	3.5	Aerostigmat Off Galileo, barrel I.D.	29.50
165	6½	3.5	Ernemann Anagt., foc. mt. barrel I.D. flange	49.50
165	6½	3.5	Schneider Xenar Type D, Compd shutter	59.50
165	6⅜	4.5	Carl Zeiss Tessar, barrel I.D. flange foc, mtd.	54.50
161	6⅜	4.5	Kodak Anagt., barrel I.D. flange	34.50
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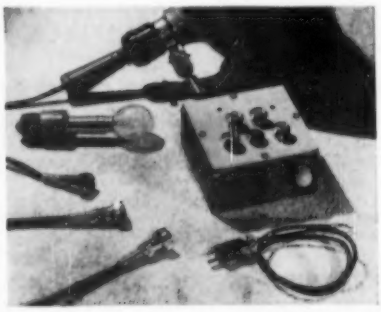
tion or from sunlight bouncing back diffused from buildings, streets, or beach. Or you may take a hand in the matter and fill in the shadows with light from a reflecting surface of some sort—or even a small flashbulb. Indoors, working with flash, all you need do is use an extension flash for the mainlight (or "sun") and the customary flash-at-the-camera as the fill-in.

When you work this way, it's easy to figure the correct exposure. You follow the flash or film manufacturer's recommendations for that film-and-flash combination, computed for the distance from the mainlight (the "sun") and the main subject. Theoretically the angle and the distance of the camera should affect this; in actual practice, at least in black-and-white, you can usually ignore this. If you will keep in mind that the flash at the camera is just meant to fill in the shadows, you will see to it that this is the weaker or more distant of the two lights, so that it has no appreciable effect on your exposure.

You can simplify the procedure if you will stick to similar flashbulbs in similar reflectors, and make sure the mainlight (the extension) is closer to the subject than the fill light (the one at the camera).

Lighting balance? Easy enough. If you want lots of fill-in, no deep shadows, make sure the mainlight is not much closer to the subject than is the fill-in. If you want definite shadows, resulting from less fill-in, the extension light should be much closer to the subject than the camera light. If you want deep, dramatic shadows, with no fill light at all, just use the extension, with no flash at the camera. And keep in mind that in all three cases



Battery-capacitor power pack built by Rus Arnold is useful for large, complex flash setups, especially color. It operates on three hearing-aid batteries, at 90 volts. Pilot light on front panel shows when unit is ready for flash. Also shown here are flood reflector, socket extender for adapting small bayonet-base bulbs, and connector cords for shutter and extensions.

(at least for black-and-white) it is safe to determine the exposure simply by the distance between the extension light and the subject.

What about extension-flash equipment? First of all, your source of electrical power is important. Your present flashgun, while entirely adequate for single flash, may not be able to handle extensions consistently. There just is no question about it today; if you want to use extension flash you *must* use a B-C (battery-capacitor) source. Before buying a new flashgun, if your present unit has some provision for plugging in an extension, check into the possibility of replacing your present batteries with a B-C cartridge. While this B-C insert costs more than the ordinary batteries, it is more economical, as it will last much longer. When the battery in the B-C cartridge finally gives up, all you need replace is the battery, not the entire cartridge.

So now you have a camera equipped with a flashgun using a B-C power source, and a place to plug in an extension. Now you need that extension. You can use an ordinary photoflood reflector assembly. If you use bayonet-base flashbulbs your dealer can supply you with an adapter to fit the medium-screw socket; you should also get a screw-in booster or two in order to raise the flashbulb out from the socket about as far as the photoflood bulb would reach. This makes more efficient use of the reflector. And be sure the switch in the socket is in the "on" position when you try to use it.

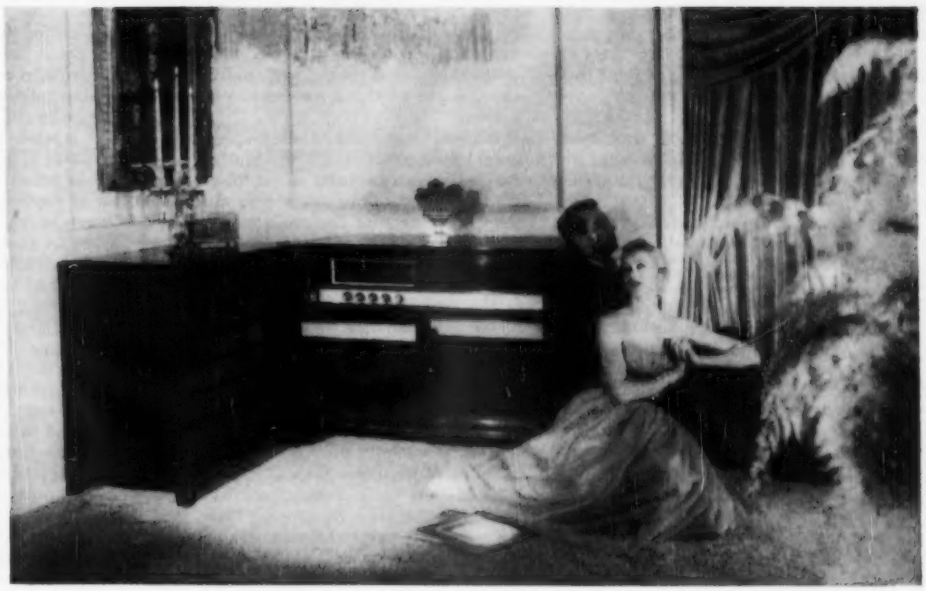
If you do much extension-flash work you will prefer the extension units made for that purpose. If possible, get them equipped with the same reflectors as the one on your camera, so you can have a better idea of your lighting balance. The better modern extension units are made specifically for use with B-C power sources.

For positive firing, all flashbulbs operated on a B-C unit should be wired in series, instead of the usual parallel hookup. To complete the circuit, the B-C current has to go through the shutter contacts, from there to the first flash, then to the second, then to the third, and so on, depending on how many you are using. That is why an extension unit made for B-C current contains within itself a plug-in to accommodate an additional extension. Some units are made for use with either B-C or ordinary battery current. Always read the manufacturer's directions for hooking up the extension units you select.

The advanced flash photographer who shoots many extension flash pictures soon finds himself coveting, and soon after that buying, slave units. These are self-powered extension units, containing heavy-duty B-C circuits with built-in photoelectric cells to set them off. Slave units are just like any other extension units, except that there is no connecting wire. In fact, if the only extension units employed are slaves, you don't even need a B-C unit; any old flashgun that will fire a flash will do the job.

When the flash at the camera goes off, the photocell on the slave picks up the impulse and releases a powerful wallop of current to set off the flashbulb in the slave's reflector. One flash at the camera can set off any number of slave units, provided each photocell is positioned so it can "see" some one flashbulb in the system go off.

Fellow photographers frequently ask



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me about the time lag in using slave units. Certainly there is a time lag, but don't overestimate it. Since the slave sets off its flashbulb when the pulse of light from the initiating flashbulb reaches the slave's photocell, it is obvious that the two flashbulbs cannot possibly go off simultaneously. The slave is bound to be late. But how late? Not enough to make any difference on close-ups.

When there is some distance (fifteen feet or more) between initiating flash and slave, there begins to be a time lag, but this has nothing to do with the speed of light. The slave goes off when the pulse of flash reaching it gets high enough above the prevailing level of illumination. (This is why, parenthetically, slaves don't work so well—if at all—in sunlit areas.) Obviously, the closer the slave is to the original flash, the brighter the light that reaches the photocell, and therefore the sooner that light gets bright enough to trigger the unit.

All of which means simply that you can count on your slave to synchronize at 1/200 only if it's close to the original source. At 15 feet 1/100 may be okay, or you may need 1/50. Beyond that, try 1/50; if you find that doesn't work, you may have to go to 1/25.

Remember, also, that the slave unit isn't fussy. It will react to your flashbulb—but it will also react to the other fellow's. If you find yourself working in the same location with other photographers using slaves, don't uncover the photocell of your slave unless you're sure nobody else is about to shoot a flash. Better still, get together with the others, plan a little cooperation. You might even pool slave units—and that way get more light sources and at the same time avoid confusion.

What about color photography? The same arrangement of equipment and flashbulbs can be used as for black-and-white, except that of course you must use the proper type of flashbulb for the particular color film plus, if needed, the proper filter. Also, for color it is best to stick to the slower shutter speeds—no faster than 1/50 if at all possible—for better color balance.

As for lighting, colors calls for flatter light than black-and-white. Going back to what we said earlier about lighting balance, you will remember that this means plenty of fill-in light. That is, the extension flashes should not be much closer to the subject than the flash at the camera.

Also, you will remember that we hedged about the suggestion that you compute exposure strictly by the distance from main extension flash to subject; we said this going only for black-and-white. For color, which has much less exposure latitude, you will have to do a little experimenting, using standardized lighting setups.

In shooting color subjects requiring involved lighting setups on location, follow the standard method of lighting the subject first with photofloods or with ordinary 100-watt lamps in photoflood reflectors. When the lighting looks right, I take a meter reading, first to make sure the illumination is within the proper balance for color, and also to get an index to my subsequent flash exposure. The exposure is determined approximately by figures the color-film manufacturer will supply on request. For instance, they will tell you that if you light your scene with #1 floods, whatever *f*-stop your meter calls for at the 32-second mark would be about the right exposure to try with #22 flashbulbs in the same reflectors.

Having taken the meter reading, I turn off the lights, unplug the reflectors from the 110-volt line, remove the lamps, and replace them with flashbulbs. The lighting equipment is then hooked into a series circuit. For years I used a series wire such as the one described earlier in this article, but operating on the 110-volt line. This had to be fired by a heavy-duty momentary-contact switch, on the open-flash method; it could not be synchronized with the shutter. Also, to prevent blowing fuses and exploding flashbulbs, both of which are prone to happen on 110-volt current, I used a #2 photoflood in series with the flashbulbs, as a resistor. This system is entirely satisfactory, and I still find use for it.

Recently, however, I've built a simple B-C power-pack, a mighty little palmful of current that uses three small hearing-aid batteries and can handle almost any load I've ever had to flash. I hook all my lighting units into this power-pack. When the circuit is complete and ready to flash, a pilot light goes on, literally giving me

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CAMERAS, STILL

6. (a) Brochure: How to take pix of TV programs. (b) Brochure: Information on copy and close-up. (c) Brochure: Especially for teachers desiring to use a camera in classroom work. ARGUS CAMERAS, INC.

8. (a) Book: Complete reference book for amateur and beginner, "The Bolsey Guide," 128 pp., 70 illus., charts, tables, $1.95. (b) Circular: Bolsey Precision Cameras, features new Jubilee Threesome, prices. BOLSEY CORPORATION OF AMERICA.

9. (a) Booklet: "Rollei," 12 pp., illus., description and details, Rolleiflex, Rolleicord. (b) Booklet: The Practical Accessories for Rollei Cameras, 24 pp., illus. BURLEIGH BROOKS.

11. (a) Brochure: "Bino-Fotography." (b) Booklet: "How to Select Binoculars." D.P. BUSHNELL COMPANY.

18. (a) Brochure: List and prices of 400 items for Exakta cameras. EXAKTA CAMERA COMPANY.

23. (a) Booklet: For Prize Winning Pictures—Graflex, Specifications, etc. 32 pp., illus. GRAFLEX.

26. (a) Booklet: The Royal Robot; (b) Booklet: Robot Underwater Camera; (c) Booklet: Robot Accessories. INTERCONTINENTAL MARKETING.

31. (a) Booklet: Holiday Photography, 25¢. KONICA CAMERA COMPANY.

34. (a) Booklet: Minolta "A"; Minolta 35, Model II and Rokkor lenses. (b) Booklet: Minolta Autocord and Minoltacord. MINOLTA CAMERA COMPANY.

38. (a) Catalog: Discusses each Polaroid Land Camera, accessories, gives hints and ideas for using 60-second pictures, illus. POLAROID CORPORATION.

39. (a) Brochure: Information on book titled "35mm Photography With A Praktiflex." PRAKTICON COMPANY.

41. (a) Brochure: "Realist 35"; detailed facts on Model A & B, accessories. (b) Brochure: Commercial Applications of the Stereo-Realist, 4 pp., illus., plus 12 pp of detailed information relating to modern selling. (c) Brochure: Realist 45, description, illus. REALIST, INC.

45. (a) Booklet: Omega 120; data, description. SIMMON BROTHERS.

52. (a) Booklet: "The Voigtlander Line"; complete details, description, illus. (b) Booklet: Complete detailed information of Hasselblad Camera, accessories, 26 pp, illus. (c) Hasselblad Super Wide Camera, details, description of camera, accessories; 32 pp., illus. (d) Folder: "Hasselblad 1000F", illus., descriptive pamphlet of Hasselblad and accessories. (e) Folder: Illustrated and descriptive folder on Hasselblad Super Wide. WILLOUGHBY'S WHOLESALE.

53. (a) Brochure: "Edixa"; describes 35mm Edixa cameras, accessories, lists prices. WIRGIN BROS.

CAMERAS, MOTION PICTURE

7. (a) Brochure: The Auricon Cine-Voice; 16mm camera for professionals. (b) Brochure: Same as above, except for home movie makers. (c) Booklet: How to use your Cine-Voice, 16mm sound-on-film Recording Camera. (d) Catalog: 40 pp., illus., Auricon Cameras. BERNDT-BACH, INC.

12. (a) Brochure: "The Eumig 88"; description, details, lists accessories for this 8mm movie camera. CAMERA SPECIALTY.

30. (a) Booklet: 8mm full line covering all 8mm movie cameras and projectors. (b) Circular: 16mm full line covering all 16mm movie cameras and projectors. (c) Circular: Christmas mailing folder describing the new Christmas packages available. (d) Book: Keystone Movie Scene Record Book; 15¢. KEYSTONE CAMERA COMPANY.

43. (a) Booklet: Cameras by Revere. REVERE CAMERA COMPANY.

MOTION PICTURE ACCESSORIES

29. (a) Booklet: "Home Movies the New Craig Table Top Way," 20 pp., illus., including tips on tricks, etc., movie editing. (d) Booklet: "Editing for Better Movies" by Leo Heffernan, 50¢. KALART COMPANY, INC.

37. (a) Booklet: "How To Take Better Sports Films," 24 pp., illus. (b) Magazine: "The Bolex Reporter," quarterly, available thru franchised Bolex dealers. PAILLARD PRODUCTS, INC.

42. (a) Brochure: RCA 400 Junior and Senior 16mm Sound Projectors; non-technical description of operating features. Illustrates sound equipment which may be combined with projectors in semi-permanent or permanent installations, 12 pp., illus. RADIO CORPORATION OF AMERICA.

43. (b) Booklet: Features and operation Curvamatic Splicer. (c) Booklet: Curvamatic Splicer, details, data. (g) Booklet: Motion Picture Equipment. REVERE CAMERA COMPANY.

49. (a) Booklet: "How To Shoot Home Movies" by Johann Van Zandt, detailed information on use of Vistascope for home movies; 8 pp., illus. (b) Folder: Descriptive pamphlet on Vistascope. VISTASCOPE.

LENSES

9. (c) Booklets: 1. Schneider Lenses, 10 pp., illus.; 2. Schneider Additional Lenses; 3. Xenotar; 4. Angulon; 5. Tele-Xenar; 6. Xenon; 7. Symmar; 8. Cine-Lenses from 6.5 to 105mm; 9. Componon, Componar; 10. Xenor, general purpose lens; all well illustrated. BURLEIGH BROOKS.

11. (c) Pamphlet: "Those Startling Fujinons"; discusses the new 50mm F1.2 and 35mm F2 lenses. D.P. BUSHNELL COMPANY.

15. (a) Chart: How to use Two Ednalite Portrait Lenses. (b) Brochure: Portrait Lens Instructions; tables, charts on +1, +2, +3 portrait lenses. EDNALITE OPTICAL COMPANY.

16. (a) Leaflet: "How To Use Enteco Polarizing Screens and Enteco Polarizing Filters with Still and Movie Cameras." (b) Leaflet: New Enteco data and information charts on close-up photography with supplementary lenses. (c) Leaflet: Re iseed edition of Enteco "Filter Information," handy filter factor and film speed chart, filter types. ENTECO INDUSTRIES.

17. (a) Booklet: "Take A Tip From Hollywood," describes Elgeet lenses, instructions on home movies, etc., 36 pp., illus.; 10¢. ELGEET OPTICAL COMPANY.

18. (b) Brochure: Steinheil lenses, wide angle, telephoto and movie lenses. (c) Brochure: Angenieux Lenses, complete information on construction, angles of view, relative magnification, range, focal length. (d) Catalog: "Equipment Information from Exakta," lists latest lenses recommended for the Exakta Camera, 28 pp., illus. 10¢. EXAKTA CAMERA COMPANY.

28. (b) Folder: How to Use Your Elitar Soligor Lens, descriptive information on Telephoto, Wide Angle, prices. INTERSTATE PHOTO SUPPLY.

31. (b) Chart: Shows test of Hexanon 50mm F/2.8 lens as used in the Konica II. KONICA CAMERA COMPANY.

32. (f) Booklet: Leica Lenses; 34 pp., illus.; data, descriptions. E. LEITZ, INC.

52. (f) Booklet: "Zeiss Lenses For The Hasselblad Camera," detailed information and discussion of Zeiss lenses for the Hasselblad; 10pp, illus. WILLOUGHBY'S WHOLESALE.

54. (a) Booklet: Raptar 8mm cine lenses. (b) Booklet: Raptar 16mm cine; depth of field projection charts. (c) Booklet: "How to Have More Fun With Your Camera." WOLLENSAK.

PROJECTORS, SLIDE

5. (a) Booklet: How To Select A Slide Projector. AMERICAN OPTICAL.

6. (c) Brochure: "Curtain Time," hints to help with color slide shows. ARGUS CAMERAS, INC.

21. (c) Folder: Describes Skan automatic "slide-cooling" projector, illus. G-M LABORATORIES, INC.

44. (a) Brochure: A complete listing of all regular View-Master Reels and Packets, including product prices. (b) Brochure: Stereo Today, a complete coverage of the View-Master Stereo System, information on products in this system. SAWYER'S, INC.

48. (a) Leaflet: Engineered projection equipment; data, details. VIEWLEX.

FLASH EQUIPMENT

1. (a) Booklet: Various styles of lighting equipment for still pictures, indoor movies and 3-D shots. (b) Folder: Describes use of multiple floodlamp control box, gives electrical facts affecting use of flood and flash lamps; 6pp. ACME-LITE MFG. CO.

4. (a) Booklet: "How To Take Professional Flash Pictures With Your My-T-Myte Flashbulbs," 8pp., illus. AMPLEX.

6. (d) Booklet: "Flash"; data on flash for Argus cameras, 8pp., illus. ARGUS CAMERAS, INC.

13. (a) Booklet: "Light Makes the Picture, Synctron Takes It Better." (b) Booklet: Current technical data on Synctron models. (c) Catalog: Includes accessories, technical information, prices, individual specification sheet for each model. (d) Folder: "55 Quick Facts on Dry Battery and Dynascal Power." DORMITZER ELECTRIC COMPANY.

22. (a) Folder: "Triangle Lighting" formula for taking indoor pix with light. (b) Booklet: Photoflash Tips. (c) Bright Ideas-flash pix of parties, kids, adults. (d) Photolamp Data—lighting, exposure, film speed for flash, flood, other lamps. (g) Booklet: The M-2 Bulbs; data information on the "tiny" bulbs. GENERAL ELECTRIC.

23. (b) Folder: Graflite. (c) Folder: Stroboflash. GRAFLEX.

24. (a) Booklet: "Strobonar Units," 16pp, illus. (b) Booklet: "Synchro-Mite," 8pp, illus., flash units. (c) Booklet: Professional Flash Synchronizers; including solenoids, reflectors, battery cases; 16pp, illus. (d) Booklet: "Synchro Units"; 8pp., illus. (e) Folders: 1. Fotoeye; 2. Koiled Kord; 3. Strobonar Six; 4. Strobonar Seven. HEILAND.

34. (b) Booklet: Minolta Jr. B-C Flash Gun. MINOLTA CAMERA CO.

25. (a) Folder: Sun-Lite II; description and illus. on speedflash. (b) Folder: Sun-Lite 500, description and information, 6pp, illus. (c) Folder: Flash Saver, description, 4pp. (d) Manual: Sun-Lite II instruction booklet, detailed information on Sun-Lite II Portable Speed Flash, all 3 models; 20pp, illus; 25¢. HERSHEY MFG. COMPANY.

28. (a) Folder: Describes 3 models of electronic flash, Expert IV, Matador, Reporter I, prices. INTERSTATE PHOTO SUPPLY.

35. (a) Booklet: Eveready Battery Engineering Bulletin on flash photography, 12pp. illus.; issued periodically. (b) Eveready Batteries, data, helpful information "B," "B-C" batteries. NATIONAL CARBON COMPANY.

36. (a) Leaflets: Technical information and data on use of the Megalume electronic flash. (b) Pamphlet: "Reciprocity Failure and the Determination of Exposure With Some Electronic Flash Equipment." NEMS-CLARKE, INC.

46. (a) Brochure: Listing of lighting equipment for semi-professional or advanced amateur. (b) Brochure: Complete listing of lighting equipment for the amateur and movie maker. (c) Booklet: "Indoor Photos Made Easy," how to do indoor lighting, 10pp, illus. SMITH-VICTOR CORPORATION.

47. (a) Folder: "Flash is Easy—Flash is Fun"; complete flash instruction for advanced, amateur, beginner. (b) Booklet: How to Take Better Pictures and Have More Fun With Flash; 32pp. illus. (c) Booklet: Color Flash with Box Cameras. (d) Booklet: How to Throw a Snapshot Party; 24pp, illus. (e) Card: Wallet Size, gives correct F-stops. (f) Brochure: Basic Lighting Placement, illus. (g) Specification Sheets: 1. Blue Dot Line; 2. Projection Lamps; 3. Darkroom and Enlarger Lamps; 4. Super-floods. SYLVANIA ELECTRIC.

8. (c) Exposure Guide: Pocket size, gives correct F-stops. BOLSEY CORPORATION OF AMERICA.

50. (a) Calculator: Vest-pocket size; b&w and color settings at varying distances, speeds, f-stops. 10c. (b) Brochure: The ABC of Flash Photography; guide to how, when, why to use flash bulbs. (c) Brochure: Your guide to better pictures thru better lighting; comprehensive discussion of Westinghouse bulbs. (d) Booklet: Betty Furness Says, illus.; on projection lamps for home movies. WESTINGHOUSE.

55. (a) Booklet: Descriptive data and information on Limelite "60"; 14pp., illus. (b) Folder: Describes Limelite Electronic Flash; 4pp. illus. LIME-LITE CORPORATION.

57. (a) Brochure: 6pp., Mallory B-C Cartridges photo flash item; complete cross-reference unit to flash attachment; 50 units; Mallory B-C Mercury Cartridges. (b) Leaflet: Complete explanation of application of Mercury for foto-flash. P.R. MALLORY & CO.

PROCESSING EQUIPMENT AND MATERIALS

9. (d) Leaflets: 1. Nikor Developing Tanks; 2. Nikor Film Processing Machine. (e) Brochure: Veigel Enlargers; description, data Exact 35, Amatex 35, Exakt 66. BURLEIGH BROOKS.

10. (a) Brochure: Illustrating design and function of Model 45M Enlarger, 24pp. (b) Leaflet: Additional uses of Model 45M Enlarger. (c) Pamphlet: Discusses characteristics and operation of Model 57MB. (d) Book: A Brief 73 Year History of Enlarger Design, 32pp. CHARLES BESELER COMPANY.

19. (a) Booklet: "How to Buy an Enlarger." FEDERAL MANUFACTURING AND ENGINEERING CORP.

27. (a) Leaflet: Time-O-Lite Printer. (b) Leaflet: Time-O-Lite Meters and Switches. INDUSTRIAL TIMER.

32. (g) Brochure: Focomat Enlarger, data, description. E. LEITZ, INC.

33. (a) Booklet: "Marshall's Guide for Hand-Coloring Photographs," special section on heavy oils, 36pp, illus. 25¢. (b) Pamphlet: Color Chart; Marshall's photo-oil colors, price list of sets, accessories. 10¢. (c) Pamphlet: Make Life More Colorful, discusses photo-coloring; (d) Pamphlet: Information on the photo-oil pencil. JOHN G. MARSHALL MANUFACTURING CO.

45. (b) Catalogs: Omega A-2, B-7, B-8, D-2, D-3, E-5; (One on each model, specify which you want.) SIMMON BROTHERS.

56. (a) Folder: Describes "Static Master," gives uses and prices, 3pp, illus. NUCLEAR PRODUCTS.

58. (a) Brochure: Discusses Lisco Cut Film Holder; gives data and information on exclusive features. LISCO PRODUCTS.

60. (a) Booklet: Clayton P-60 Fine Grain Developer; detailed instruction on use; 16pp, illus. CLAYTON CHEMICAL CORP.

EXPOSURE METERS

20. (a) Booklet: Catalog sheet and booklet describes original direct-reading, photo-electric exposure meter, reading directly in f: stops, with film speed charts. (b) Brochure: "Ideal Rangefinder," instructions for calibrating rangefinders. (c) Brochure: Catalog sheets, golf club selector guide, information on Long-Range Rangefinder and its uses. FEDERAL INSTRUMENT CORP.

21. (a) Circular: Describes the Skan Quick Meter, price, information. (b) Booklet: Technical data, information on use and care of Skan Meters, helpful hints, 24pp, illus. G-M LABORATORIES, INC.

22. (e) Leaflet: GE Exposure Meters, significant features which adopt one of three GE meters to specific requirements. (f) Booklet: Color Control Meter and Variable Color Filter; how to achieve full control of color. GENERAL ELECTRIC.

51. (a) Circular: Describes Model 735, the Weston Master II Exposure Meter and the Direct Reading Exposure Meter, Model 853. (b) Pamphlet: "Using Weston Exposure Meters With Polaroid Land Cameras." WESTON ELECTRICAL INSTRUMENT CORP.

PICTURE TAKING ACCESSORIES

40. (a) Booklet: "New Super Quick-Set Universal Photographic Support," illustrates and describes new system for handling cameras and related accessories, 12pp. (b) Folder: "Whitehall Tripods."6pp.illus.QUICK-SET,INC.

59. (a) Catalog: 12pp., illus—describes all types of camera bags and leather goods of use to the photographer, lists prices. J. B. PERRIN CO.

FILM, PAPER

3. (a) Booklet: Ilford Flat Films, 12pp, illus: information and technical data. (b) Brochure: Ilford Roll Films, data and description; 6pp. (c) Circular: Ilford Microphen Developer, how to use it, and what it does. ALCO PHOTO SUPPLY.

14. (a) Book: "DuPont Photographic Films"; gives detailed information on photographic films, papers, chemicals; fundamental elements of photography, 85pp. bibliography, well illustrated. 35¢. (b) Book: "DuPont Photographic Papers"; designed to assist in print making. Information on selection of proper paper and correct use; surface designation chart, formula section; 57pp, illus. 35¢. DUPONT & COMPANY.

43. (d) Booklet: Features and instructions on uses of Diaversal Enlarging Paper. REVERE CAMERA CO.

VIEWERS

2. (a) Booklet: Describes in detail features of Admiral Slide-Light Viewer; 8pp. ADMIRAL PHOTO PRODUCTS.

SLIDES, STEREO

43. (e) Booklet: Features of Shield 'N Vue Slide Projectors. REVERE CAMERA CO.

TAPE RECORDERS

43. (f) Booklet: Features of hi-fi "Balanced Tone" Tape Recorders. REVERE CAMERA COMPANY.

19. (b) Circular: Model 37C; Model 47A; description, data. FEDERAL MANUFACTURING & ENGINEERING CORP.

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41c	42a	43a	43b	43c	43d	43e	43f	43g	44a	44b	45a	45b
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Color Processing

As a direct result of Kodak's consent decree agreeing to license Kodachrome and Kodacolor processing to "outside" laboratories, two famous names in the motion-picture field—Pathé and Technicolor—have announced plans to engage in amateur color finishing. Pathé laboratories is investing $1 million in a new subsidiary, Pathé Color, Inc., which expects to start processing both Kodachrome and Kodacolor early in 1956. The Technicolor Motion Picture Corporation for its part decided at a meeting of its directors on September 27, 1955 that it would engage in the processing of amateur Kodachrome film as the first step in a planned diversification program. Specific dates and details were not disclosed at the time of the announcement.—

Calendar of exhibitions

*Conducted according to the recommended practices of the Photographic Society of America.

The Grand National Photographic Contest, Agfa India Limited, Bombay, India.
Closes December 31, 1955.
No entry fee, empty carton of Agfa film must be submitted with each print or slide.
Pictures to be published in "Agfa Photo Gallery".
For information and entry blanks, write Agfa Photo Contest, Agfa India Limited, 198, Jamshedji Tata Road, Bombay 1, India.

1956 Newark International Salon of Photography*, Vailsburg Camera Club and Mayor Leo P. Carlin, Newark, N. J.
Closes January 7, 1956, slides; January 21, 1956, prints.
Entry fee $1, four slides or four prints allowed.
On exhibit at Newark News Auditorium, Ivy Street School Auditorium, U. S. Veterans Hospital of East Orange, January 19, 20, 24 (slides); Newark Public Library, February 4 through 29 (prints).
For information and entry blanks, write Catherine Coursen, 223 Prospect St., East Orange, N. J.

60th (Jubilee) Annual Open International Exhibition*, Birmingham Photographic Society, Birmingham, England.
Closes January 14, 1956.
Entry fee $1, four prints or four slides allowed.
On exhibition at the Galleries of the Royal Birmingham Society of Artists, New St., Birmingham, February 11 through 25, 1956.
For information and entry blanks, write D. McM. Henderson, 254, Acheson Rd., Shirley, Birmingham, England.

23rd Wilmington International Exhibition of Photography*, Delaware Camera Club, Wilmington, Del.
Closes January 16, 1956.
Entry fee $1, four prints or four slides allowed.
On exhibit at Delaware Art Center, Wilmington, Del., February 5 through 26, 1956.
For information and entry blanks, write W. Leroy Miller, P. O. Box 401, Wilmington 99, Del.

11th Chicago International Nature Photography Exhibition, Nature Camera Club of Chicago, Ill.
Closes January 16, 1956.
Entry fee $1, four slides; $1 plus postage, four prints.
On exhibition at Chicago Natural History Museum, February 1 through 26, 1956.
For information and entry blanks, write Blanche Kolarik, 5801 W. 63rd, Chicago 38, Ill. —

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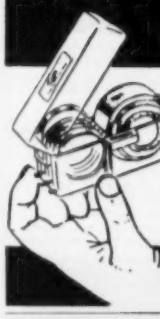

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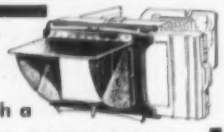

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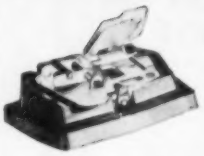

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INDEX OF ADVERTISERS
Popular Photography January 1956

ADVERTISER	PAGE NO.
Acme Lite Manufacturing Company	96
Air Photo Supply Corp.	151
Airequipt Manufacturing Co., Inc.	32
American Optical	24
American School of Photography	91
American Speedlight Corp.	99
Ansco	SECOND COVER
Antonelli School	102
Argus Cameras, Inc.	29
Arkay Corp.	38
Arrow Metal Products Co.	91
Art Center School, The	91
Atkinson Color Print Service	102
Awon Films	138
Bass Inc., Alfred	104
Bell & Howell	93
Beseler Company, Charles	7
Brockway Director Corporation	18
Brooks Cameras	117
Brooks Institute	103
Brown-Forman Industries	98
Burke & James, Inc.	37
Burleigh Brooks, Inc.	25
Bushnell & Co., Inc., D. P.	5
Calumet Manufacturing Company	103
Camera Import Corporation	133
Canon Sales Co., Inc.	12
Capital Camera Co.	102
Central Camera Co.	104
Century Photographic Equipment Co.	144
Cinema Lens Co.	152
Cohen's Exchange, Inc., Abe	145
Color King Labs	126
Davidson Manufacturing Co.	36
Delpro Sales Co.	144
Delta Photo Supply	153
Dowling's Fifth Avenue	107, 108, 109, 110, 111, 112
Eastman Kodak Company	FOURTH COVER, 87, 88, 89
Edixa Camera Works, Wirgin Brothers	11
Edmund Scientific Corp.	166
Enteco Industries	6
Erie Scientific Corp.	33
Exakta Camera Company	21
F R Corporation, The	8, 9
Federal Manufacturing & Engineering Corporation	18
Freestyle Sales Co.	132
Galef & Son, Inc., J. L.	39
General Electric	THIRD COVER
Germain School of Photography	102
Graflex, Inc.	16, 17
Grand Central Camera	118, 119
Haber & Fink, Inc.	134
Heiland	35
Interstate Photo Supply	22
Kalart Co., The	105
Kinnard Co.	91
Kling Photo Corporation	13
Konica Camera Co.	34
Kruger Corp.	96
Kurshon & Lang	96
Leitz, Inc., E.	23, 40, 41
Marshall Mfg. Co., Inc., John G.	28
Mico Photo Products	105
Minifilm Camera Corp.	136, 137
Minolta Cameras	19
National Camera Repair School	102
National Photo Coloring School	104
Nega-File Co., The	33
New York Institute of Photography	14, 15
Nikon Incorporated	30
Olden Camera & Lens Co.	114, 115
Panoram Film Labs	158
Peerless Camera Stores	120, 121, 122, 123, 124, 125
Penn Camera	128, 129
Photographic Importing & Distributing Corp.	154
Polaroid Corporation	3
Popular Photography	142, 150, 155, 156, 157, 165
Quick-Set, Inc.	20
Ray-Vogue	104
Riken Optical Industries, Ltd.	33
Ritz Camera Centers	148, 149
Servicemen's Color Print Co.	158
Spiratone, Inc.	140, 141
Sterling-Howard	151
Superior Bulk Film Company	96
Supreme Photo Supply Co.	143
Sylvania Electric Products, Inc.	31
TV Workshop	104
Ta-Mar, Inc.	105
Testrite Instrument Co., Inc.	96
Three Dimension Company	92
Tiffen Marketing Co.	26
Voigtlander	97
Wall St. Camera Exch.	147
Western Photo Sales	158
Weston Exposure Meters	38, 103
Willoughbys	127, 135, 139
Zeiss, Inc., Carl	27

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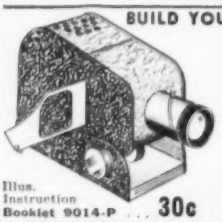

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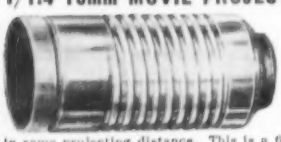

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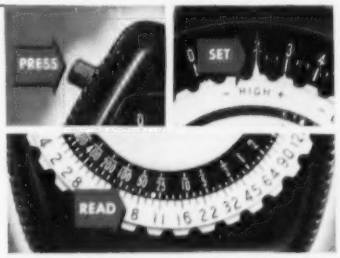

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